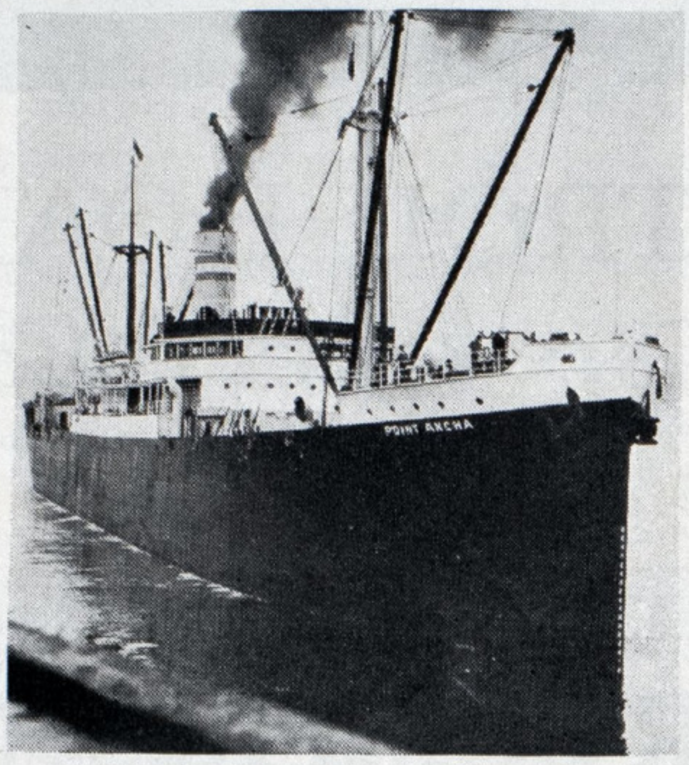
Marine Review

SHIP OPERATION SHIPBUILDING CARGO HANDLING

The National Publication Covering the Business of Transportation by Water

CLEVELAND FOUNDED 1878 NEW YORK



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Marine Review

FOUNDED 1878

SHIP OPERATION - SHIPBUILDING - CARGO HANDLING

Volume 64 **September, 1934** **Number 9**

Secretary Wallace Attacks The Merchant Marine!

IT IS unthinkable that President Roosevelt will support the pro-foreign merchant marine policy outlined by Henry A. Wallace, secretary of agriculture, in a recent letter to Schuyler Otis Bland, Democratic representative from Virginia, and chairman of the house merchant marine and fisheries committee.

Had the secretary appeared in the house of parliament in England, during a recent debate on a proposed subsidy for British shipping, and there stated the views expressed in his letter, he would, no doubt, have been widely cheered and very probably would have received the thanks of parliament for his sweet reasonableness. It would be hard to find a parallel in our history for so glaring an instance, of a high placed member of the government, in offering to give up the nation's birthright for a mess of pottage.

Mr. Wallace believes that in the interest of our export trade we should be willing to accept as an import, "shipping services rendered by foreigners," as well as commodities. By implication he places American shipping in the category of the less efficient industries and suggests that such industries should be sacrificed to save the more efficient and the more essential from social and economic standpoints and, then he has the grace to add, with consideration to national defense problems.

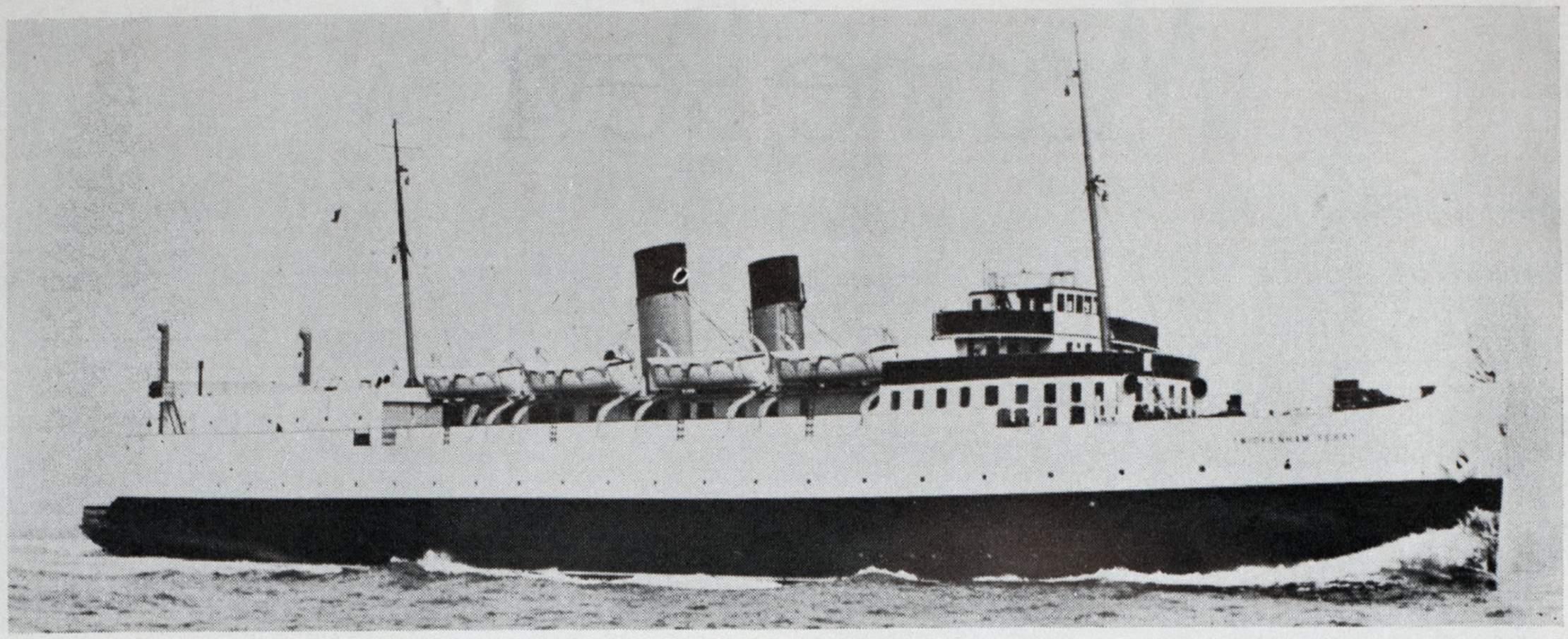
He also makes a point to suggest, "it may be to our economic advantage as a nation to concentrate on the exploitation of our rich internal resources, leaving partly to foreigners the carrying trade in which our natural advantages over them are not as great as in other forms of production." Mr. Runciman himself could not have stated more clearly, exactly the attitude the British government and shipping men would like to have us adopt toward our merchant marine. Mr. Wallace believes also that, "if we further protect shipping, we shall export less of our farm commodities."

The question is, shall we or shall we not have a merchant marine. Without government aid our merchant marine will recede to its former insignificance when we carried less than 10 per cent of the trade to which we were a party. Even under present conditions, with government aid, we are now carrying only approximately one-third of our own commerce.

Reams of evidence brought forth in a decade of congressional debate, before the passage of the merchant marine act of 1928, points to the need of an adequate merchant marine of our own, both in the interests of our commerce and national defense. Innumerable investigations by committees of the widest variety of personnel have produced voluminous evidence of our need of a merchant marine. It would seem to be unnecessary to again call attention to the plight we were in during the World war and the stupendous expenditure then required, in the midst of the emergency, to make up for long neglect of this necessary arm to our national welfare and defense.

Again and again situations have arisen which have emphasized the value of American merchant ships. Are we a great mercantile marine nation to give up the art of shipbuilding and become impotent in creating our own vessels of commerce, buying from others a service essential to the development of our resources? And if so, why bother about building a navy. since all authorities are agreed that strength on the seas depends on fighting ships, bases, and a merchant marine? Without the latter, the naval establishment might well be compared in effectiveness to that of a three-legged stool with one leg gone.

Fortunately we have in the White House a man whose traditions are deeply rooted in the sea and whose conception of maritime adequacy will not be disturbed by the specious arguments of the secretary of agriculture. Furthermore, the congress, Republicans and Democrats alike, would never countenance a defeatist policy for our merchant marine.



Twin screw, turbine geared, cross-channel train ferry steamer, Twickenham Ferry, on trials June 18, 1934. Built by Swan, Hunter & Wigham Richardson Ltd. for Southern Railway, England, for service between Dover and Dunkerque

CROSS CHANNEL FERRIES

Twin Screw, Geared Turbines, Coal Burning

AN IMPORTANT project for the improvement of transportation across the English channel, between Dover, England, and Dunkerque, France, is nearing realization in the completion and successful trials on June 18 of the steamer TWICKENHAM FERRY, first of three especially designed vessels under construction at the Neptune yard, Walker, Newcastle-on-Tyne, of Swan Hunter & Wigham Richardson Co. Ltd., for the Southern Railway. The second vessel, named HAMPTON FERRY, was launched on July 30 while the third vessel the SHEPPERTON FERRY is on the stocks.

In order to perfect the efficiency of this service, locks are being constructed at both ports which will enable the vessel to link up with the shores on level terms at any state of the tide which has a range of about 20 feet. The new vessels combine all the advantages of the most modern cross channel boats and the conveniences of an ocean liner, with high class accommodations and promenade decks.

Railroad Cars and Automobiles

Each vessel is capable of carrying a train of 12 sleeping cars, or alternatively 40 loaded freight cars. In addition, a special garage is provided on the after end of the upper deck for the accommodation of 25 automobiles. Cars can be driven directly on the ship by an inclined ramp. During the voyage motorists are at liberty to use the passenger deck accommodations and on arrival at destination can drive their cars off the vessel. Additional parking space for automobiles is available at the after end of the train deck, where the surface between the rails is raised for this purpose. About 25 automobiles or heavy motor driven vehicles can be accommodated in this space after the railroad sleeping cars or freight cars have been secured in place on board.

The new service will make it possible for a sleeping car express to leave Victoria station, London, at midnight and arrive at Paris the next morning in time for breakfast without passengers leaving their berths unless they desire to do so to enjoy the luxuries of a first class passenger liner for a short period. This represents a marked advance in rapid and comfortable transit and the service to Paris can easily be extended to more remote places on the Continent. It is also easy to visualize the inauguration based on this service, of a wide range of short excursions to the Continent from practically all parts of England.

Both the design and the building of the TWICKENHAM FERRY and her two sister vessels have been carried out under the general direction of Sir Westcott Abell, professor of naval architecture at Armstrong college, Newcastle-on-Tyne, who has been retained by the Southern Railway company as its expert advisor. In the design of these vessels, representatives of the owner wisely decided to take full advantage of all the modern facilities and high individual talent in naval architecture and marine engineering for which Great Britain is justly famous the world over.

Principal Characteristics

Name	Twickenham Ferry
Builder	Swan, Hunter & Wigham Richardson Ltd.
Owner	Southern Railway
Launched	March 15, 1934
Trials	June 18, 1934
Length, overall, feet, inches	360 0
Breadth, feet, inches	62 0
Depth, keel to train deck, ft., in.	20 0
Height, train deck space, ft., in.	15 6
Draft, loaded, feet, inches	12 6
Deadweight, at load draft, tons	1200
Cargo capacity—12 sleeping cars or 40 freight cars; and 25 automobiles.	
Passenger capacity	550
Speed, in service, knots	16½
Speed, on trials, knots, over	17½
Twin screw, S.H.P. @ 200 r.p.m.	5000
Propelling machinery, Parsons turbines, single reduction geared, one high and one low pressure for each shaft, developing 2500 S.H.P. per shaft.	
Boilers, four, Yarrow, lbs. per sq. in.	250
Superheat—degrees Fahr.	500
Coal burning	Taylor underfeed stokers
Propellers. Four-bladed, solid, manganese bronze	
Sister Vessels	Two
	Hampton Ferry; Shepperton Ferry
	Hampton Ferry launched on July 30, 1934
Classification	Lloyd's Register of Shipping

Utmost Care in Planning

No vessels of comparable size and importance were ever, it may be said, more carefully planned. Model experiments of both hull and propellers, as reported in a preliminary article on these vessels, published in the July issue of MARINE REVIEW, were carried out with the utmost care and under the most skillful supervision, to an extent hardly ever before realized. These model experiments were conducted at the National Physical laboratory at Teddington under the direct supervision of G. S. Baker.

Furthermore, the builder of the vessels, Swan, Hunter & Wigham Richardson Co. Ltd. has had a long and successful experience in building ferry steamers.

The machinery is also of high quality, consisting of two sets of Parsons' steam turbines and single reduction gears. Each set drives a four bladed solid manganese bronze propeller of aerofoil section. The main propelling engines and other machinery were installed by the shipbuilder. Another interesting feature, for vessels of this type, is the choice of coal as fuel. And in this connection a striking innovation is the installation of Taylor mechanical stoker of underfeed type to serve the four Yarrow watertube boilers. In this particular case one of the advantages of coal is that it can be run on board direct in railroad freight cars and tipped into the ship's bunkers without handling after leaving the coal mines.

Principal particulars of the TWICKENHAM FERRY and sister vessels are noted in the table on the opposite page. Four lines of rails are provided over the greater part of the train space. At the stern these rails converge into two tracks by which the trains pass on to the shore across a draw-bridge at the end of the deck. Trains can be run on and off the vessels without the slightest inconvenience to the passengers.

Special attention has been given to safety and fire prevention. Lifesaving appliances have been installed to take care of a total of 550 people.

Watertight bulkheads are so arranged that the vessels will remain afloat with any two adjacent compartments flooded. Furthermore the lifeboats are instantly available.

Passenger accommodations on the upper deck are set off by fireproof bulkheads and boundary walls of steel plating. In this way separate sections can be isolated at will. Elaborate fire fighting appliances are provided throughout the vessels.

Successful Sea Trials

Sea trials of the TWICKENHAM FERRY, on June 18 were carried out as nearly as possible to correspond to service conditions. For the trials the vessel was fully loaded with freight cars of coal. During the trials the vessel more than fulfilled expectations. A marked steadiness at all speeds and the absence of smoke or any other indications that coal fuel was being used were especially noticeable. Under favorable weather conditions a speed of over 17½ knots was obtained.

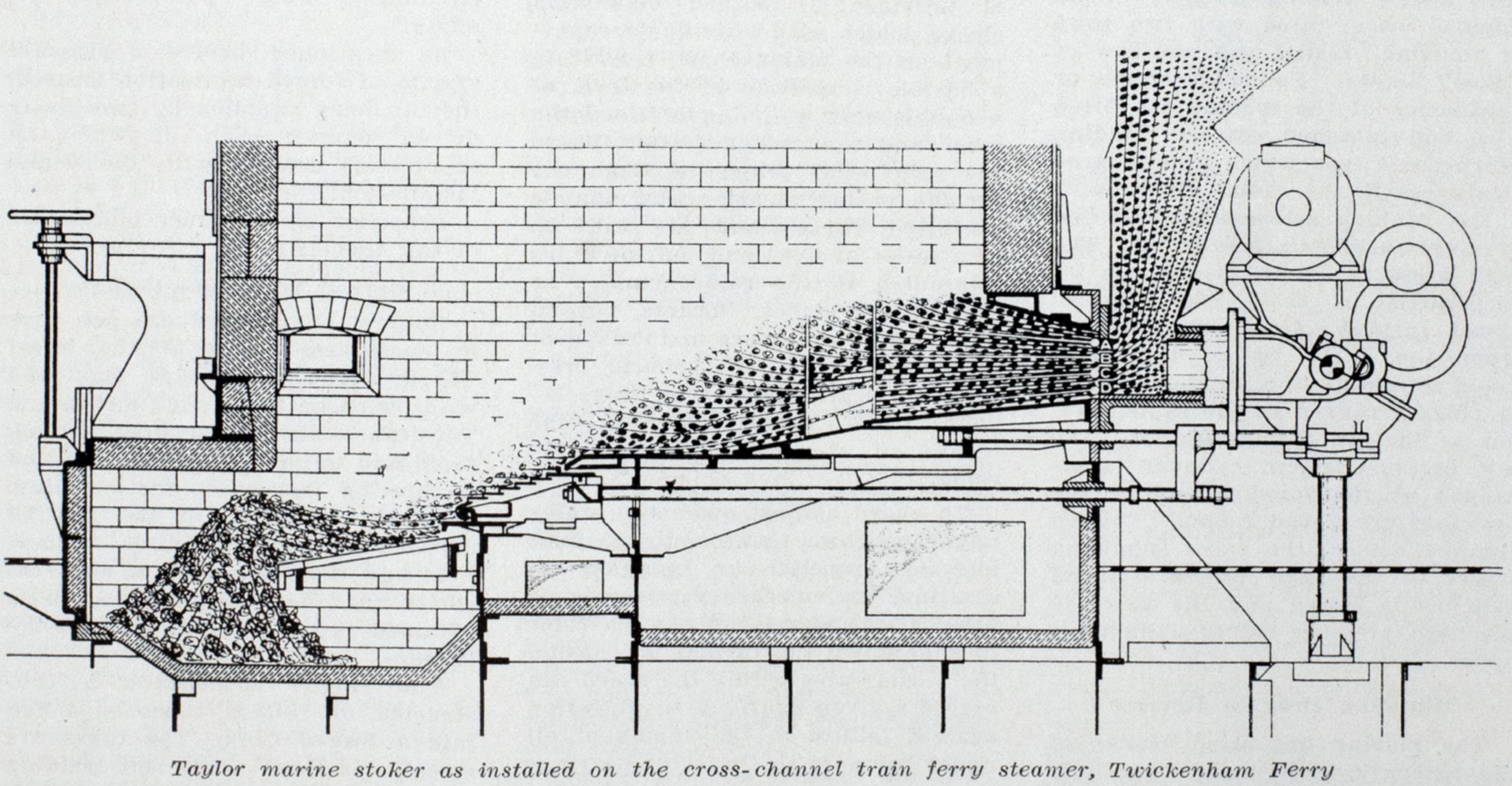
Coal consumption and the steam performance of the turbines were carefully noted during the six-hour trial. The results showed that the coal used, which came from a mine near Dover, was being burned under the most efficient conditions.

Opportunity was taken during the trials to test the maneuvering of the vessel when turning, going ahead and astern, and when starting and stopping. In addition the vessel was kept running for a period of about one and a half hours at full speed astern during which an average speed of nearly 12 knots was attained.

The trials were attended by representatives of the Southern Railway company: Swan, Hunter & Wigham Richardson Co. Ltd.; Yarrow & Co. Ltd.; Parsons Marine Steam Co.; and Taylor Stoker Co. Ltd. Sir Westcott Abell, consulting naval architect for the owner, and G. S. Baker, superintendent of the William Froude laboratory, were also present. During the dinner on board R. P. Biddle, assistant docks and marine manager of the Southern Railway, said he had never been on a more successful sea trial, and congratulated the shipbuilder and all the other firms participating for their splendid co-operation in producing such a highly satisfactory vessel.

Main Propelling Machinery

The vessels are propelled by twin screws, each of which is driven by two steam turbines of the latest Parsons' type, one high pressure and one low pressure, driving separate pinions gearing into a single gear wheel. The shaft on which the gear wheel is mounted is in turn coupled



Taylor marine stoker as installed on the cross-channel train ferry steamer, Twickenham Ferry

1. The stoker has our retorts, a bank of tuyeres or air nozzles occurs between any pair of retorts and between each end retort and the furnace side wall.

2. The diagram shows a longitudinal section through a retort. A portion of the fuel bed has been omitted from the retort (about one-quarter of the grate length from the front wall) revealing the adjacent tuyere bank and the extent to which this is buried below the fire.

3. The progress of the fuel from the hopper to the ash dump is visualized by the tracks of four fuel-particles A.B.C. and D. These are "underfed" and enter the fire from below at points along 75 per cent of the grate length.

4. When the fuel particles reach the level of the tuyere banks they are in the form of porous coke, the volatile having been released gradually during their progress down the retort.

5. Combustion occurs above the tuyere bank level. The crust of porous coke is thoroughly oxygenated by air from the tuyeres below and acts as a "scrubber" which brings the oxygen into intimate contact with the volatile rising from the retorts. Oxygenation of the coke crust is such that combustion is "slice free".

6. As the "rise" of volatile occurs along 75 per cent of the grate length the combustion chamber is relatively "flame free" resulting in an increased rate of fuel consumption within smoke limits and intense radiation from the incandescent fuel bed surface.

to the shafting by which its propeller is revolved.

Each set of propelling machinery develops 2500 shaft horsepower, or a total of 5000 shaft horsepower for the vessel, at full power. Under these conditions the turbines run at 3550 revolutions per minute with a reduction ratio to the propeller of 17.56 to 1 which gives about 202 revolutions per minute for the propeller.

Each turbine consists of a rotor and an outer casing having an external support at each end to carry the bearings in which the rotor revolves. The rotor is fitted with rows of blades known as "moving" blades on to which the steam is directed by similar rows of blades known as "fixed" blades projecting inward from the turbine casing or cylinder between the rows of "moving" blades. Steam issuing from the exit edge of one row of "moving" blades is guided by the "fixed" blades to the next row of "moving" blades and so on throughout the turbine. The lengths of the blades, both rotor and cylinder, gradually increase from the steam end to the exhaust and the openings between the blades are also correspondingly greater to allow for the passage of the steam, the volume of which gradually increases as the pressure falls during its passage through the turbines to the condenser.

The first stage of the high pressure ahead blading consists of an impulse wheel fitted with two rows of "moving" blades and one row of "fixed" blades. Following stages or expansions of the turbine are fitted with end-tightened reaction blading of Parsons' type which allows large clearances in the radial direction.

For running astern high and low pressure turbines are provided. The high pressure astern cylinder is incorporated in the high pressure ahead turbine casing, but isolated from the same by a diaphragm gland consisting of a number of rows of rings arranged in the same manner as for the turbine glands. The low pressure astern cylinder is arranged at the forward end of the low pressure ahead casing. When running astern, the valve supplying steam to the high pressure ahead cylinder is closed and the valve to the high pressure astern cylinder is open.

Minimum Drag in Reverse

The moving and fixed blades of the astern cylinders are oppositely handed to those of the ahead turbines in order to reverse the direction of rotation. A vacuum is maintained in both the high pressure and low pressure astern cylinders when the turbines are running in the ahead direction, and in the high pressure and low pressure ahead cylinder when the turbines are running astern.

Maximum economy of steam consumption is obtained by suitable adjustment of the axial blade clearances.

The low pressure ahead turbine is fitted with ordinary reaction blading throughout. The high pressure astern turbine is fitted with a single two-row impulse wheel only and the low pressure astern turbine has a two-row impulse wheel followed by three stages of reaction blading.

Steam is led into one end of the high pressure turbines through which it flows with a continuous drop in pressure and thence to the low pressure ahead turbine from which it exhausts into a condenser fitted directly to the under side of the low pressure casing. As the pressure of the steam, in its passage through the turbine, exerts an end pressure in the direction of its flow, a balancing ring termed a "dummy" is fitted on the other side of the steam inlet. The function of this "dummy" is to balance the steam thrust by presenting an opposing surface of about equal diameter on which the steam can exert pressure, thus reducing the load to be carried by the thrust block fitted at the steam end of the turbine. This thrust block carries the unbalanced end thrust of the rotor, and maintains the rotor in its correct axial position.

Flexible Coupling Used

On the other end of the rotor there is provided a toothed claw and sleeve, which with a similar arrangement on the pinion shaft, constitute a flexible connection in the form of a double claw coupling between the rotor and the pinion shafts. Where the rotor ends project through the turbine casing steam sealed glands are fitted. These glands are made up of a series of fixed and moving rings alternated in the same manner as the turbine blades. Pockets, beyond these rings, which are maintained at a slightly above atmospheric pressure and segmental carbon rings beyond these pockets prevent the escape of steam into the engine room.

To guard against overspeed which might occur in the remote event of loss of propeller or breakage of shafting, an emergency governor is fitted at the steam end of each rotor to shut down the turbine by closing the steam valve before the speed can exceed a given figure. As a protection against failure in the supply of oil under pressure to the rotor bearings this emergency governor is also arranged to shut off the steam supply to the turbine should the oil pressure fall below a certain value.

The transmission of power to the shaft is by means of single reduction gears of the double helical type, cut on machines of special construction to obtain the high degree of accuracy necessary for quiet running. For lubricating the gear wheel teeth, jets are arranged spaced 1½ inches apart across the whole width of the tooth face. Lubrication of the rotor and gearing bearings is by oil supplied under pressure and the supply of oil to the gearing sprayers is taken from the same source.

Special consideration has been given to the maneuvering of the main turbines. The control levers of both port and starboard sets have been brought to a single point and are so arranged that both turbines can be controlled by one engineer.

Auxiliary Machinery Particulars

The auxiliary machinery is steam driven and operates under full boiler pressure, (250 pounds per square inch) saturated steam being supplied to all units with the exception of the generator sets which operate with the same degree of superheat (500 degrees Fahr.) as the main turbines.

The main condensers are of the regenerative type and are designed to maintain a vacuum of 28½ inches (barometer, 30 inches) in service.

Two-stage feed heating is used, the first stage being supplied with the exhaust steam from the auxiliaries, and the second with steam bled from the main turbines. Special attention has been given to the feed water supply. A fresh water evaporator and filtrators are installed. An auxiliary condenser of vacuum type is installed provided with its own self contained circulating water pump and air pump.

As mentioned before a pressure system of forced lubrication is used, the oil being supplied by two steam driven pumps, each of which is capable of dealing with the whole installation.

Propeller shaft thrust blocks are of the Michell type.

Yarrow Watertube Boilers

Boilers, of which there are four in each vessel, are of the latest Yarrow watertube type equipped with superheaters and airheaters. The tubes are all straight, giving rapid and unimpeded circulation and facilitating inspection and cleaning. A large proportion of the heating surfaces is exposed to direct radiant heat and the furnace is of such capacity that complete combustion is obtained before the gases reach the tubes.

The Yarrow superheater is constructed of U-bend tubes expanded into a forged drum. The tubes are steeply inclined and self-draining and the large integral drum, which is hollow forged, conserves a valuable reserve of steam for maneuvering.

For access to both boiler and superheater tubes, it is only necessary to remove the manhole doors at the ends of the drums from which internal inspection and cleaning are

(*Continued on Page* 40)

Bids Received for Building Twelve Naval Vessels

ON AUG. 15 Secretary Swanson, in the presence of department officials, high ranking officers of the navy and shipyard representatives, opened bids for the construction of 12 of the 24 new naval vessels authorized in the building program for 1934-35. It is understood that the other 12 vessels are to be awarded to navy yards.

The bids opened on Aug. 15 are for the construction in private shipyards of one heavy cruiser, one light cruiser, two 1850-ton destroyers, five 1500-ton destroyers and three submarines. No less than 13 shipyards submitted bids and there was a marked increase in cost over the original estimates. This, it was explained, is due to the uncertainty of the cost of materials and labor during the period required for construction. It is to take care of this probable increased cost that the higher bids were entered. An alternate and very considerable lower bid was made in each instance on the basis of an equitable readjustment during the contract.

Heavy Cruiser Bids

Heavy cruiser No. 45 of 10,000 tons, with 8-inch guns, on which bids were received from four shipyards, the highest being $16,890,000 and the lowest $13,889,000 without adjustment as to possible increases in labor and material cost, was authorized by act of congress, Feb. 13, 1929.

Light cruiser No. 47 with 6-inch guns and of 10,000 tons displacement was also authorized under act of congress Feb. 13, 1929.

The ten additional vessels on which bids were received, two heavy destroyers, Nos. 381, 383, each of 1850 tons displacement; five light destroyers, Nos. 385, 387, 389, 391 and 393, each of 1500 tons; and three submarines Nos. 177, 179, 181, each of about 1300 tons, were all authorized by act of congress March 27, 1934.

For the two cruisers the funds for commencing construction were included in the regular naval appropriations act for 1935. For the construction of the ten other vessels, on which bids were received, funds have been provided from the public works administration under the allotment made to the navy.

The naval building program of 1934-1935 also includes twelve vessels to be constructed in navy yards unless otherwise ordered by the President. These twelve vessels include two 6-inch gun light cruisers each of 10,000 tons; seven 1500-ton destroyers, and three submarines.

Even after this program of 24 vessels has been definitely started, a total of 78 vessels in different classes will still be needed to bring the United States navy up to the limits provided in the 1930 London naval treaty. These 78 vessels comprise, one aircraft carrier of 14,500 tons; 2 light cruisers of a total of 17,100 tons; 24 submarines of 27,740 tons; and 51 destroyers of 77,635 tons. To reach treaty limits Japan requires only one additional vessel and Great Britain needs forty-four.

Contracts Awarded

ON AUG. 22, only seven days after the bids were opened, Henry L. Roosevelt, acting secretary of the navy, announced that contracts had been awarded for 11 naval vessels to 6 private shipyards. The awards are as follows:

One 10,000-ton light cruiser, to the Newport News Shipbuilding & Dry Dock Co., at $11,650,000.

One 10,000-ton light cruiser, to the New York Shipbuilding Co., at $11,975,000.

Two heavy destroyers (1850 tons), to Federal Shipbuilding & Dry Dock Co., each at $3,496,000.

Two destroyers (1500 tons), to Bethlehem Shipbuilding Corp., Fore River plant, each at $3,784,000.

Two destroyers (1500 tons), to United Dry Docks Inc., each at $3,430,000.

Three submarines (1300 tons), to the Electric Boat Co., each at $2,387,000.

At the same time it was announced that 13 additional vessels will be constructed in navy yards, and to be distributed as follows:

One light cruiser to the navy yard, New York; one heavy cruiser to the navy yard, Philadelphia; two submarines to the navy yard, at Portsmouth, N. H.; two light destroyers to the navy yard, Boston; two light destroyers to the Puget Sound navy yard, Bremerton, Wash.; three light destroyers to the navy yard, Norfolk, Va.; and one light destroyer and one submarine to the navy yard, Mare Island, Calif.

The awards to private shipyards were made in every case to the lowest satisfactory bidder, according to Assistant Secretary Roosevelt. He also said that several West coast firms which had submitted bids had failed to provide the necessary bond. Work will start on all ships within a few weeks as plans have already been prepared and approved by the navy department.

In order to make the bids received as clear as possible they have been tabulated below according to class of vessels. The figures given under "proposal" in each instance are flat bids without any arrangement for later adjustment, while the figures given under the heading "alternate" are subject to adjustment for increased cost of labor and material during the period of the contract.

Summary of Bids Received

One Heavy Cruiser, No. 45

To be completed Jan. 2, 1938

Shipyard	Proposal	Alternate
Federal	$13,889,000	$12,889,000
N. Y. Ship	16,000,000	13,750,000
Bethlehem	16,200,000	12,970,000
United	16,890,000	13,510,000

One Light Cruiser, No. 47

Time for building—36 months

Shipyard	Proposal	Alternate
Gulf	$12,600,000	$12,250,000
Newport News	13,700,000	11,900,000
Federal	13,997,000	13,043,000
N. Y. Ship	15,000,000	12,559,000
Bethlehem	16,600,000	13,244,000
United	16,800,000	13,440,000

Two 1850-ton Destroyers

Nos. 381, 383

Shipyard	Proposal*	Alternate*	Time (Months)
Federal	$5,258,000	$4,674,000	29
	4,608,000	4,096,000	29 – 31
N. Y. Ship	5,550,000	4,600,000	28
	5,060,000	4,225,000	28 – 30
United	5,710,000	4,570,000	28
	5,000,000	4,000,000	28 – 30
Bethlehem	5,820,000	4,660,000	30
	5,510,000	4,410,000	30 – 32
Newport News	None	None	..
	5,100,000	4,450,000	30 – 32

Five 1500-ton Destroyers

Nos. 385, 387, 389, 391, 393

Class I**

Shipyard	Proposal*	Alternate*	Time (Months)
General	$3,635,000	$3,535,000	27
	3,385,000	3,285,000	27 – 30
Los Angeles	3,640,000	3,540,000	27
	3,390,000	3,290,000	27 – 30
Gulf	3,850,000	3,750,000	22
	3,600,000	3,500,000	22 – 24
United	4,428,000	3,688,000	20
	4,100,000	3,430,000	20 – 22
Federal	4,633,000	4,212,000	27
	4,109,000	3,736,000	27 – 30
Cramp	4,705,000	None	27
	4,445,000	None	27 – 30
Bath	4,845,000	4,180,000	24
	None	None	..

(Continued on Page 38)

*—In the case of each shipyard, the first bid is for one vessel, while the second bid is for each of two; and under submarines the third bid is for each of three.

**—In the case of the five light destroyers and the three submarines, the bids under designation Class I are based on the government's design; while those noted under Class II and Classes II—A, B, C, D, E and F, are based on designs prepared by the shipyards.

NOTE:—The full names of the shipyards corresponding to the abbreviations used in the above table are:

(Bath)—Bath Iron Works Corp.
(Bethlehem)—Bethlehem Shipbuilding Corp. Ltd.
(Beth. Fore River)—Bethlehem Shipbuilding Corp. Ltd., Fore River Plant
(Beth. Union)—Bethlehem Shipbuilding Corp. Ltd., Union Plant
(Cramp)—Cramp Shipyard—A. M. Waldron, chairman on reorganization
(Electric Boat)—Electric Boat Co.
(Federal)—Federal Shipbuilding & Dry Dock Co.
(General)—General Engineering & Drydock Co.
(Gulf)—Gulf Industries Inc.
(Los Angeles)—Los Angeles Shipbuilding & Dry Dock Co.
(Newport News)—Newport News Shipbuilding & Dry Dock Co.
(N. Y. Ship.)—New York Shipbuilding Co.
(United)—United Dry Docks Inc.
(Wallace)—Wallace Bridge & Structural Steel Co.

LARGEST WELDED SHIP,

Diesel Tanker Poughkeepsie Socony

By ROBERT D. Mac MILLEN*

THE Socony Vacuum Oil Co., owner of America's most numerous merchant fleet, gave substantial recognition to the all-welded ship of larger size on Aug. 3, when its diesel driven tanker POUGHKEEPSIE SOCONY was launched at the Staten Island plant of United Dry Docks Inc. The POUGHKEEPSIE SOCONY, largest all-welded merchant vessel of any type yet to be built in the United States and, probably, in the world, is the third of three sisterships launched at the Staten Island plant in recent weeks and the sixtieth vessel built at that plant for Standard Oil Co. of New York interests.

Barge Canal—Lakes Service

The new all-welded tanker, with her sister ships of riveted design, the NEW HAVEN SOCONY which was launched June 1 and sailed from New York on her maiden voyage July 23 and PLATTSBURGH SOCONY, launched June 29 successfully completing her sea trials Aug. 1, will be used primarily for gasoline transport in the New York State Barge canal—Great Lakes and Atlantic coast trades. The last two, to be followed shortly by their all-welded sister ship, constitute the first deliveries on the oil company's current $5,000,000 shipbuilding program.

Throughout her construction period, the POUGHKEEPSIE SOCONY has held the especial interest of naval architects and other informed observers, not for any essential difference in structure nor because she was the largest welded vessel but, rather, for the readiness with which accepted forms of framing adapt themselves to the welded design, used throughout except for the stem and stern frame and a few minor details. She is of typical Socony-Vacuum "canal" type, a bulk oil carrier of 1242 gross tons and 13,500 barrels cargo capacity. Propulsion is through twin screws, driven by diesel engines of the direct reversible, air-injection, type, 375 brake horsepower each; other specifications are given later on in this article.

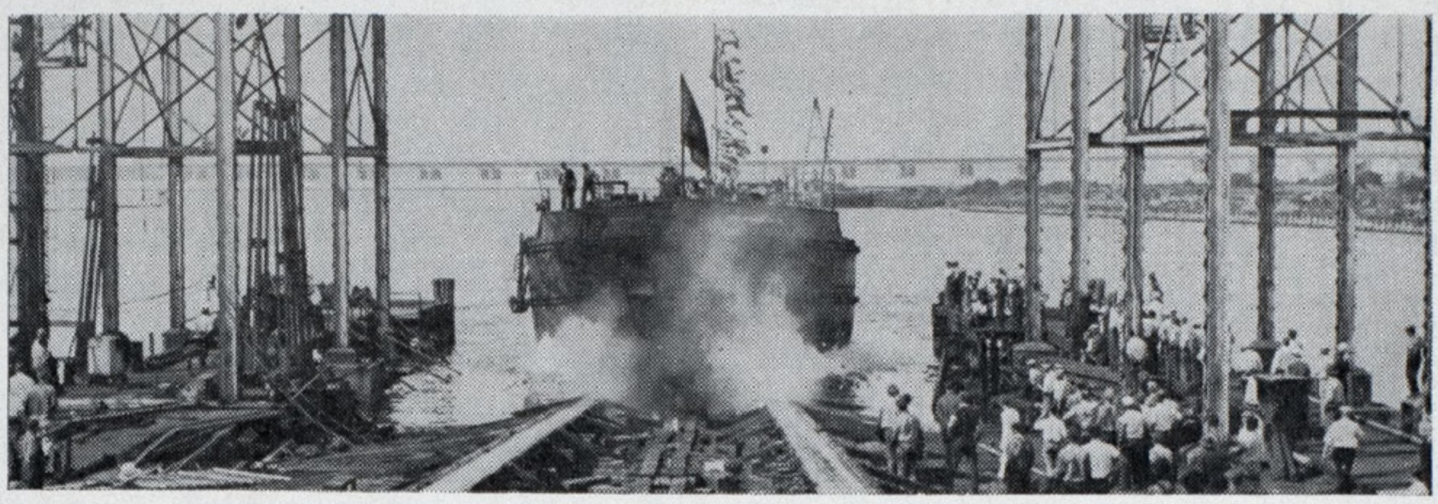
Nicholas J. Pluymert, Socony-Vacuum naval architect, in a discussion following the launching, stressed the standardized character of his company's fleet, pointing out that the new vessels are substantially the same as the Canal-Great Lakes tankers first developed in the 1923 building program; at the same time, he called the introduction of the all-welded ship into these larger categories the most drastic challenge in the history of the older type riveted vessel.

"While the all-welded hull is no newcomer among service vessels of smaller size and government craft," said Mr. Pluymert, "there doubtless will be some who will regard as revolutionary the use of that method for such a vessel as the POUGHKEEPSIE SOCONY. We feel, however, that little more than pioneering courage was required to take advantage of this great advancement in the shipbuilding art and to seize for ourselves the far-reaching economies made possible by the all-welded design. Our fleet is the product of long-continued study and development and this step is no exception."

Less Cost, Increased Capacity

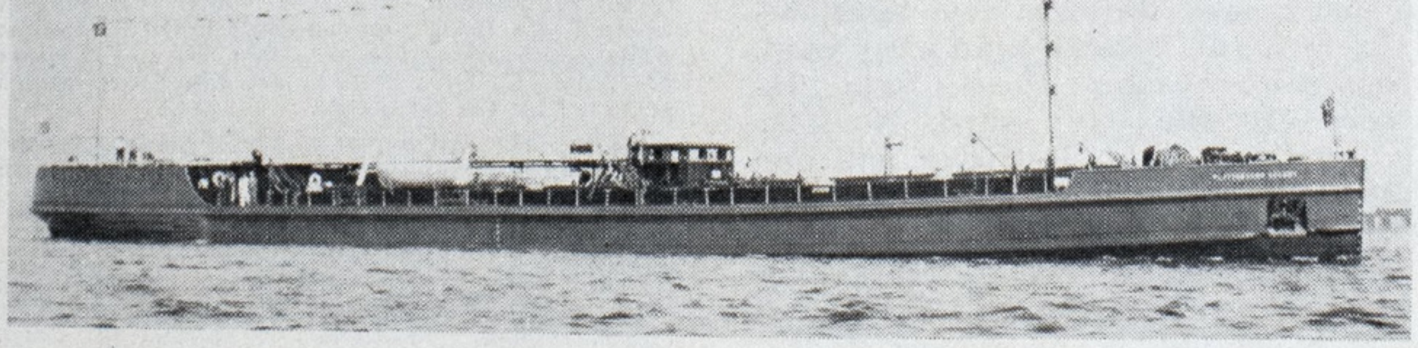
"As ship operators," continued Mr. Pluymert, "planning to gain the utmost from cheap water transport (which, in 1921, we were the first to initiate on the New York State Barge canal), we could not overlook the lower initial cost nor the immediate saving of fifty tons in weight, which permits fifty tons of additional cargo to be carried as long as the vessel runs. It is possible that from this source we might gain a full 'free trip' every year or so."

"The elimination of 217,000 rivets and the substitution therefor of 108,-

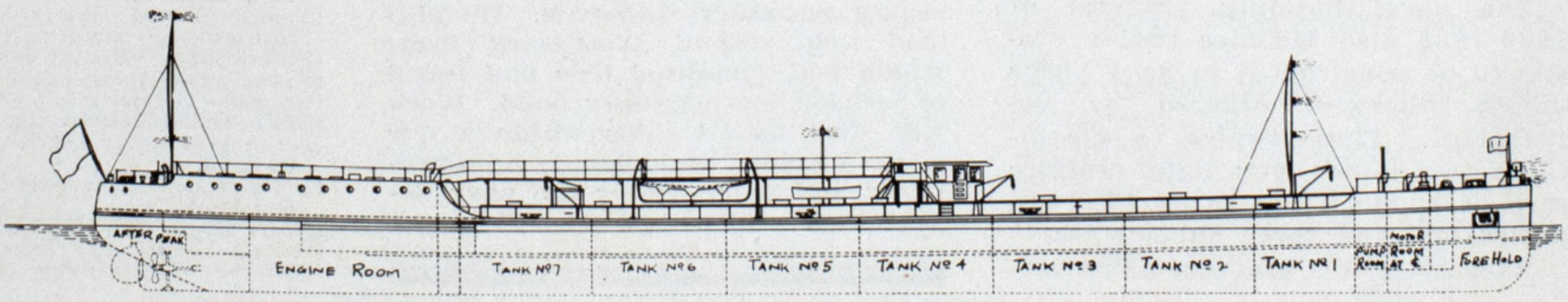


Poughkeepsie Socony—All-welded tanker, launched at Staten Island, N. Y., Aug. 3

Plattsburgh Socony — Twin screw diesel tanker on trials Aug. 1



Profile of Poughkeepsie Socony and class



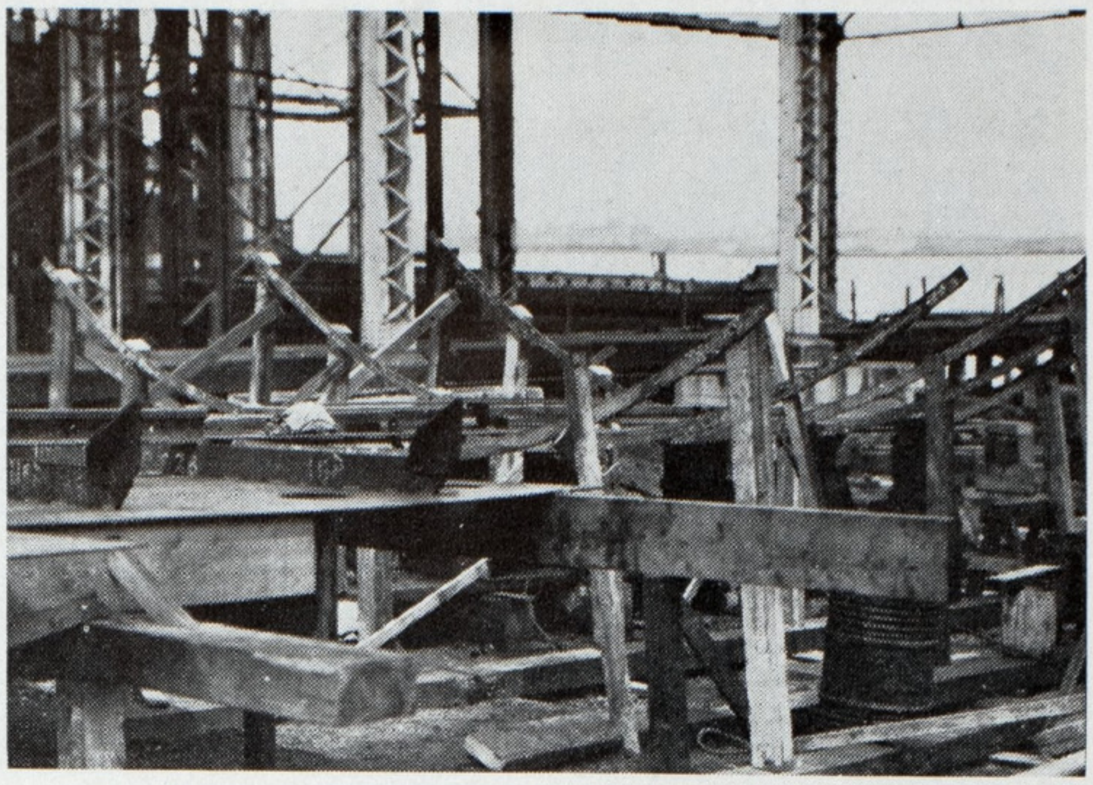
Plattsburgh Socony — Twin screw diesel tanker on trials Aug. 1

Profile of Poughkeepsie Socony and class

*The author, Robert D. MacMillen, is Eastern Manager, MARINE REVIEW.

000 lineal feet of electric welding is in large part responsible for the weight saving, but the use of lighter, stronger, members also contributes to the result," Mr. Pluymert explained. "When the time comes that steel fabricators provide appropriately-designed shapes for electric welding, I predict new economies that will be even harder to ignore."

Detailed construction of the riveted hulls was taken as the basis for all calculated structural scantlings, so that no difficulty was encountered ir obtaining the approval of the American Bureau of Shipping, in which the vessel is classed. Fifty tons of deadweight was saved, without sacrifice of strength.



CRADLE—In the construction of the all-welded tanker Poughkeepsie Socony utmost accuracy was used in the erection of the supporting form for the hull. April 21

Flat Bars for Framing

For example, in the cargo oil space of the welded ship the framing, beams and bulkhead stiffeners are not the usual angles or channels but, instead, are flat bars. While this, of course, results in the elimination of flanges, that is not its chief advantage. The main advantage is that, in order to obtain an equivalent section of stiffener members, the flat bars used are considerably thicker than the standing flanges or webbs of members conventionally employed. This results in a substantial increase in corrosion-resistance in cargo oil compartments, where water ballast is used so frequently.

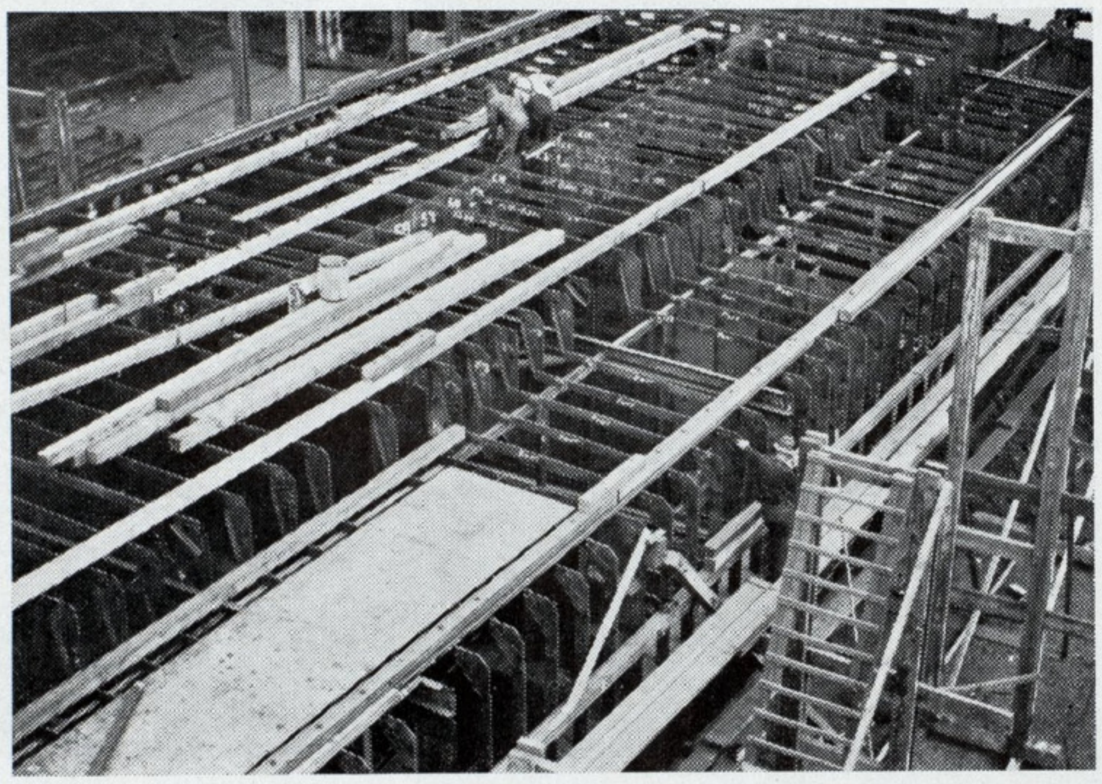
In like manner, the bracket arrangements customary in tanker construction are materially reduced by the use of welded horizontal plate stringers in association with the bulkhead or shell. It is by such means, together with the elimination of connection clips, the reduction of lap and seam widths of plating, rivet heads and the like, that the welded vessel achieves some 50 tons lighter weight than a riveted vessel of similar dimensions.

Many novel applications of welding also were made among deck fittings, such as the all-welded double roller chocks, mast fittings, awning supports, stanchions and such parts—features, all, which not only gave greater strength but saved weight and fitting-out time and money.

Utility of the welded design, however, may not be considered merely from the viewpoint of form or lessened weight, for its simplifying effect persists from the time a vessel is laid down on the drafting board until it is delivered from the ways, a completed ship; and in no phase of design or construction is the advantage more apparent than in assembly.

One of the accompanying illustrations shows the bottom forms of the "cradle" upon which the hull is erected; this cradle is added to from time to time as required and always provides a solid base for the rising structure to grow upon. The cradle as the foundation of a fair ship is erected with the greatest accuracy. This precision is reflected not only in the hull but makes it possible to carry on ground assembly to an otherwise impossible extent. In fact, large areas, such as complete bulkheads, are assembled on the ground and, when hoisted into position fit in place without forcing or drawing-up.

The fine appearance of these shop-fabricated bulkheads is shown in the accompanying illustration, (page 18) looking aft down the centerline bulkhead, which is 166 feet long and, in its completed state, weighed 35 tons, though limitations in crane capacity made it necessary to handle it in five units.

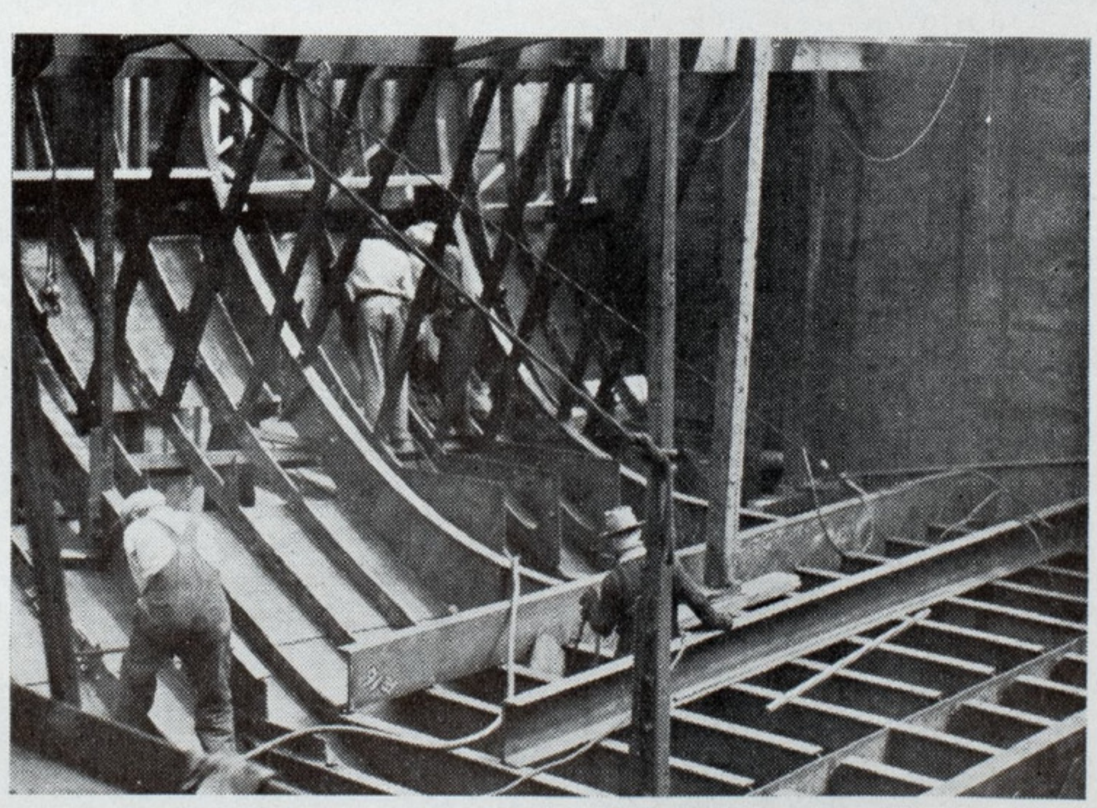


EXPANSION trunk and deck framing of the welded tanker Poughkeepsie Socony—An excellent illustration of the flat bar frame and beam construction. May 12

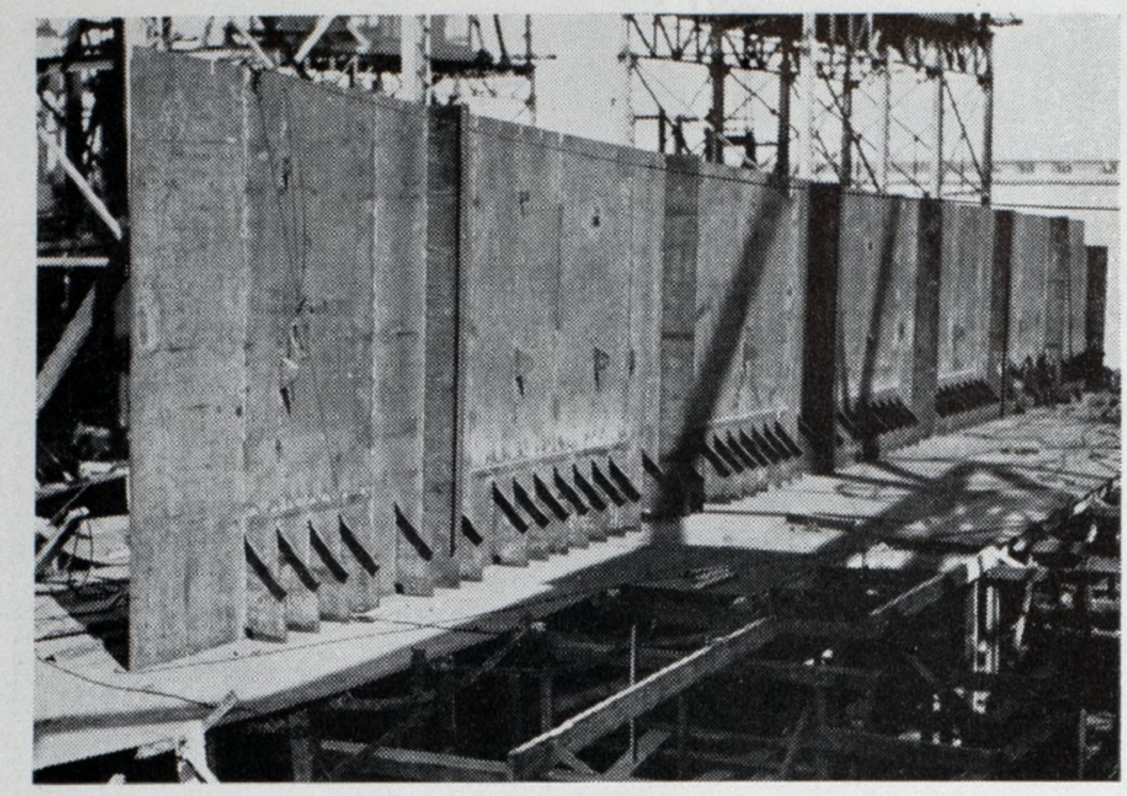
How Distortion is Avoided

An excellent idea of the flat bar construction, previously mentioned, may be had from the illustration, showing the expansion trunk, as well as the one of the engine room and the surrounding strength members.

The means by which distortion is avoided in large areas, welded in advance of erection, are clearly shown in the illustration of bulkhead 65.



ENGINE room of the welded tanker Poughkeepsie Socony as it looked on June 2. Note the flat bar frames, web frames, floors and engine foundations



CENTER line bulkhead, looking aft, April 28. This all-welded bulkhead was fabricated in the shop and installed in five sections. Total length 166 feet

This work is being carried on in the big 10,000 square foot welding shop at the Staten Island plant; the shop is floored with the usual cast iron slabs of pierced design, so that work of any size or shape may be clamped in position. This floor not only serves the purpose of accurate layout but, also, assists in relieving stresses by dissipating the heat of welding.

Other Advantages Anticipated

The POUGHKEEPSIE SOCONY, upon completion of its trial trip on the Hudson, will at once go into the Canal-Great Lakes service, where its sister ships already are at work. This service offers a severe test for vessels of any construction, especially when so near the limits of allowable clearance as in the present instance. The locks of the New York State Barge canal are only 45 feet wide, while these new ships are 41 feet 6 inches over the guards; moreover the length of 260 feet, also, is considered the limit of length for the St. Lawrence canals. Officials believe, however, that the welded vessel, with no rivets or caulked seams to start, will give a good account of itself and they see many other advantages of peculiar value to their service.

The Socony Vacuum Oil Co. was a pioneer in the New York State Barge canal with the carrying of oil. It started its service in 1920 with a few small barges of conventional harbor type, observing results carefully. With the experience gained, the company in 1921 ventured upon the construction of five barges, driven by gasoline engines; these barges were 150 feet long by 28 feet 6 inches beam by 12 feet 6 inches deep but, upon completion of the season, they were lengthened by 40 feet, making them 190 feet long and adding two tanks to their cargo capacity.

Results of these early experiments led, in 1923, to the building of the first "canal" type twin screw diesel tanker in the fleet, the TROY SOCONY, which was 254 feet long by 37 feet 6 inches beam by 14 feet deep. So successful did the company find its ultimate design and so responsive its market that, in 1924, eight more vessels of similar type were built, this time to the limit of size: 260 feet long by 40 feet beam by 14 feet deep.

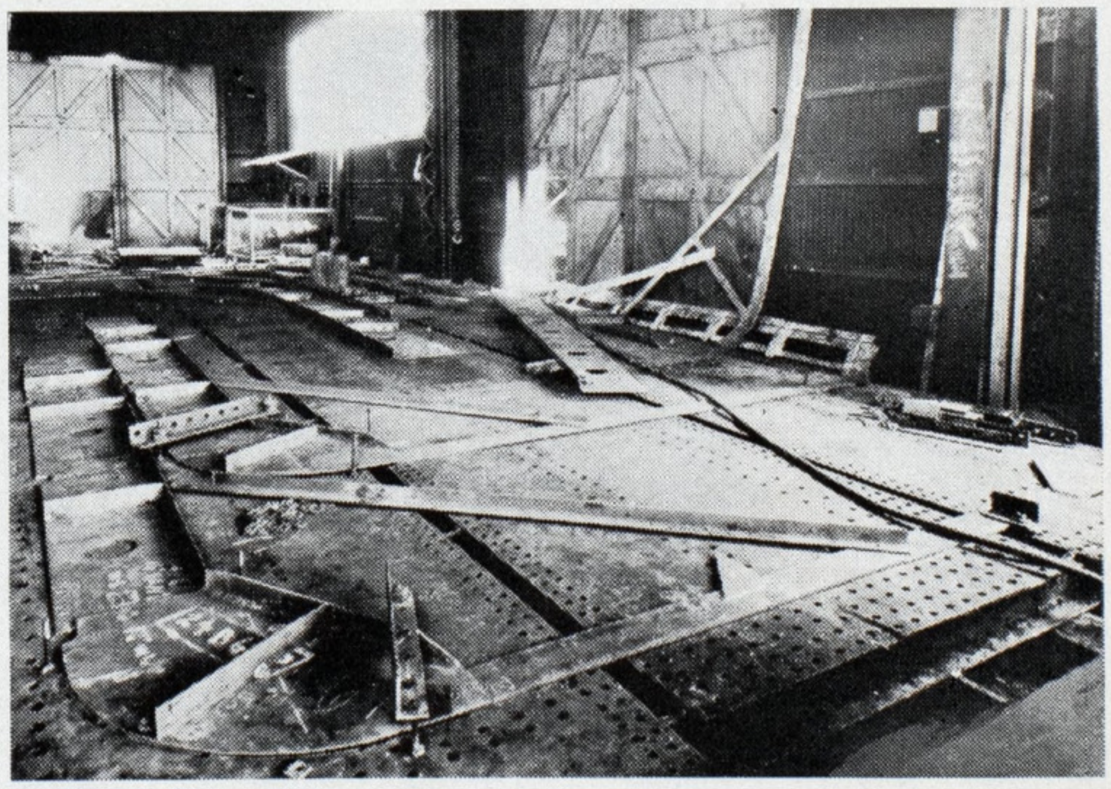
The Socony Vacuum flag identifies 241 ships in its world-wide service, 175 of them documented vessels; in addition, there are 6 vessels on long-time charter and 19 operated by foreign subsidiaries. The company's fleet is first in the American merchant marine in number of vessels and ranks third in gross tonnage.

Particulars Poughkeepsie Socony

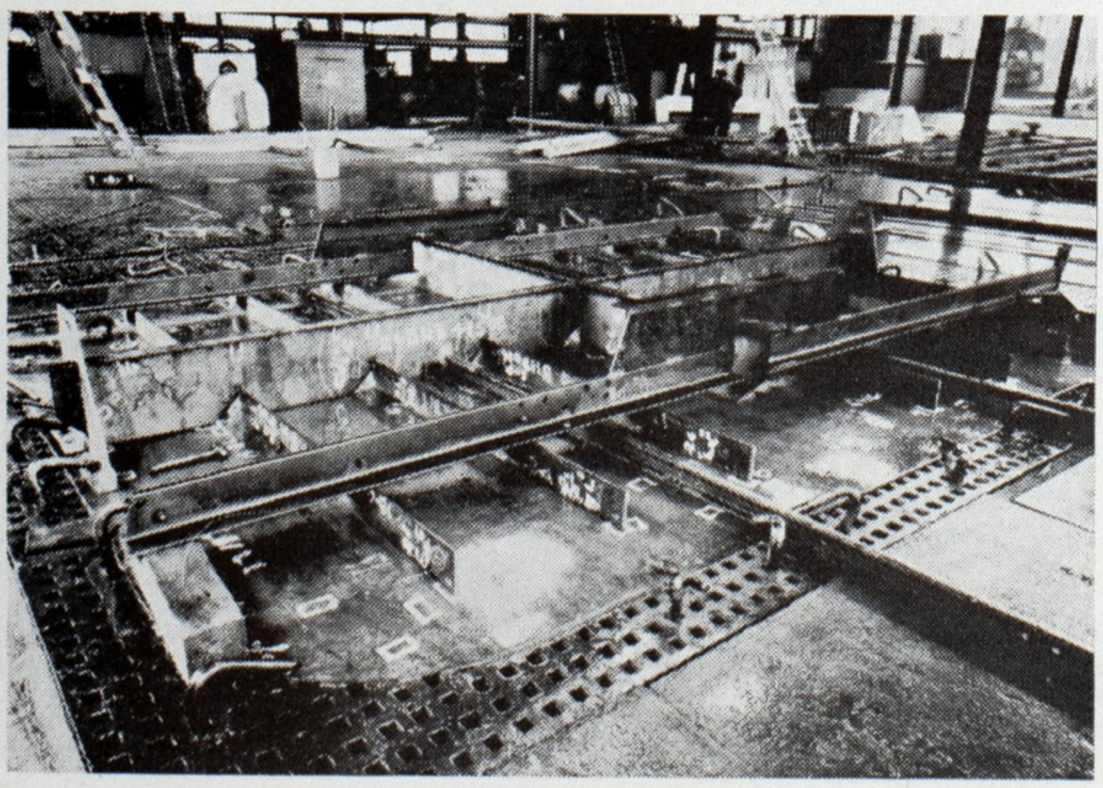
The principal characteristics of the POUGHKEEPSIE SOCONY, which also apply generally to the two riveted sister ships the NEW HAVEN SOCONY and the PLATTSBURGH SOCONY, are:

Length overall, 260 feet; length between perpendiculars, 252 feet, beam molded, 40 feet; depth molded, 14 feet, gross tonnage, 1242; cargo capacity, 13,500 barrels on a draft of 12 feet. The vessels are fitted with twin rudders.

Propulsion is by twin screws, each



TYPICAL side frame and floor assembly for the Poughkeepsie Socony, March 29. Laid out and welded in shop ready for erection



BULKHEAD No. 65—for all welded tanker Poughkeepsie Socony, March 31. Assembled, clamped down and welded on bending slab floor in fabricating shop

connected to a 375 brake horsepower, McIntosh & Seymour 6-cylinder, direct reversible, air injection, diesel engine. There are two diesel driven auxiliary generator sets. The engines are McIntosh & Seymour, 3-cylinder, 4 cycle, solid injection diesels, developing 95 brake horsepower each at 450 revolutions per minute. The generators, made by Diehl Mfg. Co. are direct current, 120 volts, each developing 60 kilowatts.

Included among the auxiliaries are two air compressors of Worthington make driven by electric motors. For fire protection there is a complete Lux carbon-dioxide system supplied by Walter Kidde & Co. There is a special type of lubricating oil filter

(*Continued on Page* 38)

COMMUNICATIONS,

as Applied to the Merchant Marine

BY CAPT. S. C. HOOPER*

IN this, the second, and concluding part of Captain Hooper's article he continues the discussion of the practical applications of means of communications in the merchant marine. The responsibility of the master and his officers in acquiring a broad understanding, and facility in the use of communications is emphasized by examples of notable disasters and rescues. He suggests, now that modern progress moves swiftly and is accepted casually, that we do not allow ourselves to be lulled into a false sense of superiority; but rather that we make every effort to master the facilities that have been developed for the increased safety and certainty of navigation.

STRIDES are being made toward the development of a device utilizing reflected under-water sound, which will make it possible for ships to detect the presence of icebergs which might menace their safety.

Commercial Communications

Under the heading of commercial communications we find the following types of service offered:

(1) Radio telegraph service, between ship and shore or ship and ship, regardless of whether similar nationalities or companies are involved, for the transaction of matters concerning the progress of the voyage, orders to vessel, etc.; and for transaction of business or personal matters of passengers or crew. This service is as simple and reliable as the ordinary domestic telegraph service. Press service is also provided by this means, which permits everyone at sea to maintain touch with events of both local and international interest. Shipping companies often utilize secret code methods for communicating important or confidential orders or information to and between their vessels at sea.

(2) Radio telephone service for the same purposes outlined for radio telegraph service, especially when personal contact is desired. In certain cases, direct connection may be had to any telephone subscriber within the confines of an entire country.

(3) Radio facsimile service between ship and shore and between ships, affording facsimile transmission of sketches, plans, documents, or photographs in the transaction of business matters for both passengers and shipping interests.

It also appears that the reception and transmission of television on board ship may become practicable, and this projected service may prove of benefit both to passengers and shipping interests, although the exact applications are not yet clearly defined.

International Control of Radio

Radio signals are transmitted through space in a wave form, each radio transmitter being capable of sending out signals on one of a number of practically constant wave lengths, or what is the same thing, at a constant number of wave cycles per second. Inasmuch as the number of cycles per second, or frequency, is generally a figure of considerable magnitude, the term "kilocycles" is employed for convenience. With transmitters and receivers tuned to frequencies sufficiently well separated in the radio frequency spectrum, it is possible for many radio stations to operate simultaneously without interfering with one another. However, this necessity for channel separation limits the total number of channels which are available for radio communication purposes in any particular region of the earth.

Although the first application of radio was to maritime requirements, the practicability of employing radio for other purposes was soon apparent, giving rise to such services as point-to-point radio telegraph, radio telephone, broadcasting, television, radio-beacon, and aeronautical radio communication. As these services grew, they demanded more channels in the radio spectrum, and the resulting situation was chaotic, to say the least. It was finally brought home to all progressive nations of the world that international allocations of frequency bands in the spectrum to specific services was imperative.

Accordingly, by an international convention, allocations were made on this basis, although in every case all nations could not agree, and it was necessary to include several regional arrarrangements. By the convention, maritime radio was restricted to certain specified frequency bands, and these have proved to be just sufficient to care for mobile communications. That convention was formulated in Washington in1927. Since that time, other services, particularly broadcasting, have made determined attempts to obtain further space in the radio spectrum at the expense of the mobile or maritime services. Thus far, these attacks have been repulsed, but the danger from encroachment by other services still remains.

The value of the international control of the radio spectrum and methods of transmission, including the elimination of all regional agreements, is readily apparent. With standardized allocations the mariner may proceed from one part of the globe to another without fear that his radio service is jeopardized by other services, or that his equipment cannot be used because of variations in regional regulation. It must be realized that no one has a greater right to the benefits of radio than the merchant marine, but unless the officers of that service insure proper use of frequencies and equipment on their own ships, and realize that unless this is done other radio interests will acquire by one or another method a part of the present internationally allocated mobile maritime radio spectrum, there can be no absolute assurance of satisfactory future radio service of either distress, navigational or commercial nature.

Responsibility of Shipmasters

Some years ago radio was a mystery to most persons, and those who did have a little knowledge of the subject were considered wizards. Nowadays even the general public has a vague notion of the meanings of such words as kilocycles, antennas, keys, microphones, head phones and the like. The cloak of mysticism surrounding the radio has been discounted; even young boys of today are building and operating their own radio equipment successfully. It has

*The author, Capt. S. C. Hooper, U. S. N., is director, naval communications, United States navy. This article has been published in two parts. The first part appeared in the August issue.

been shown definitely that any normal person is capable of learning the broad technical and operational principles of radio.

By law, masters of merchant vessels are responsible for all radio transmissions which are sent from their ships, just as they are solely responsible at all times for the safety of their commands. It seems obviously desirable, therefore, that all merchant marine officers should become familiar with the general technical and operational features of radio communication in order to exercise intelligent supervision and obtain for their ships and other ships the maximum benefit of radio. As pointed out before, they should know their radio directions-finder intimately, its limitations and peculiarities; the general construction of fathometer equipment with its efficient operation; utilization of proper time signals; reception of weather broadcasts or teletype maps for forecasting and consequent safety of navigation; use of their own radio facilities for the safety of all shipping; general world communication facilities and a broad knowledge of world communication problems.

Loss of the Vestris

During distress communications, strict supervision must be exercised over all mobile radio communications lest the rescue operations be hindered rather than aided. As an example the well-known VESTRIS disaster may be used. After that vessel transmitted her first distress signal, the distress channel was so congested with unnecessary radio transmissions from irresponsile radio operators who felt they must transmit something or anything, that succeeding distress calls and rescue communications were seriously interfered with and delayed. Conditions at that time can only be described as chaotic. Finally, the battleship WYOMING stepped in, silencing superfluous transmissions, assuming control of the radio situation, and permitting the necessary communications to proceed. Had the officers on many of the interfering ships exercised the proper supervision and prevented the transmission of unimportant messages, it is probable that much valuable time would have been saved. A good knowledge of national and international radio regulations is necessary in such cases. Masters as well as the radio operators, have a responsibility, and both must play a part in such a situation.

Case of the Tahiti

The case of the S. S. TAHITI, lost in the Pacific, furnished food for thought in connection with the knowledge merchant marine officers should possess of radio. The TAHITI was about midway between Samoa and New Zealand when she was disabled and in a precarious situation. Few radio stations exist in that part of the world and vessels are few and far between. However, by good fortune only, her distress signal was received by a New Zealand station on the usual distress frequency of 500 kilocycles (600 meters) since it happened to be transmitted two hours before sunrise. Had the message been sent during daylight the chance of its reception would have been slight, since it is a well-known fact that frequencies of the order of 500 kilocycles have a much greater effective range during darkness.

After receipt of the distress message by the New Zealand station, it was relayed to a Samoan shore station, which in turn transmitted it to the S. S. VENTURA, the latter arriving on the scene just in time to take the passengers off the sinking vessel. The VENTURA had never heard the distress signals of the TAHITI.

If masters of ships were familiar with their communication problems, and realized the possibilities of the latest radio developments, ships on isolated voyages, such as that of the TAHITI, would be equipped with suitable high frequency apparatus capable of communicating over great distances. Such use would also demand the assignment of certain high frequency channels for calling and distress work exclusively. Furthermore, if merchant marine officers were always aware of the technical limitations of their equipment and the general radio organization in various regions, they would insist on being regularly informed by their radio operators of the position of the nearest vessels which may be utilized in case of emergency. Effective use should be made of the means at hand.

It must be noted that radio operators on board ship are not expert radio engineers. Neither do many of them realize the complexity of the world's communication set-up, its disputes or problems. As radio operators, they perform their work satisfactorily, but they cannot be considered as communication officers, since the latter must have a good general background of technical developments, worldwide operational co-ordination, and the knowledge required of a merchant marine officer in order to be in a position to advise the master correctly and intelligently. No responsible master would desire any other kind of advice.

Rescue of the Florida

Intelligent use of radio direction-finders is best exemplified by the rescue of the crew of the S. S. FLORIDA by the S. S. PRESIDENT ROOSEVELT in 1929. The position reported by the FLORIDA'S radio was some 150 miles in error, and it was only by constant and careful use of the radio direction-finder, coupled with a dependence in its performance, which enabled the PRESIDENT ROOSEVELT to reach her side. It was inconceivable that the reported position could be 150 miles in error, but the faith of the master of the PRESIDENT ROOSEVELT meant the difference between success and failure. His knowledge and association with the device enabled him to use sound judgment in a trying situation. Constant use of the radio direction-finder by the master and his officers on previous voyages gave to them the assurance of the results obtained.

International Code of Signals

A valuable adjunct for communication between ships at sea and ships and communication stations on shore is available in the international code of signals.

For many years an international code has been in existence, but it was not until the current (1931) edition was made effective on Jan. 1, 1934, that there became available a modern code suited for use in connection with radio as well as visual communication facilities. The current edition of the international code of signals is published in two volumes: Vol. 1 for visual and sound signalling; vol. II for use with radio.

Familiarity with the contents of the international code and a working knowledge of the manner of its use should be of great value to masters and communication personnel of ships which travel the high seas. One of the principal advantages of the code is that it affords a means whereby ships of different nationalities may communicate with each other effectually without the necessity for the personnel of either being familiar with any language but their own. Thus, for example, in time of distress, the vessel desiring assistance and vessels in position to render aid may carry on intelligible communication with one another by means of the code even though differences in language might make plain language communication between them difficult or impossible.

While merchant ships of the principal maritime nations are in general not required by law or regulation to carry the international code of signals, a large percentage of ocean-going ships are so equipped. The frequent use of the code will have the result of familiarizing personnel with its possibilities, thus creating confidence in its use, and will also bring to light any deficiencies and result in its improvement.

The American edition of the international code of signals is published by the hydrographic office of the navy department. Its subject matter, however, is under cognizance of the office of the chief of naval operations. That office receives such comments as are submitted with the idea of improvement of the code, and transmits them to an international standing

(*Continued on Page* 36)

Large Passenger List On I. M. M. Lines' Ships

That passenger travel this summer has come back to better than what might be termed normal is evident on every hand. The *Ocean Ferry* issued by the International Mercantile Marine Co., 1 Broadway, New York, operator of the United States lines, Panama Pacific lines, American Merchant lines, Baltimore Mail line, and Red Star line, in a recent editorial, said:

"Every company ship that sailed during the month of June, with a total of 12,429 travelers, carried more passengers than it had on the corresponding 1933 departure. In one instance the increase amounted to 58 per cent. Some show only small gains but only for the reason that they had enjoyed an extraordinary popularity in 1933, and despite greatly curtailed travel had carried almost capacity lists then. This was the case with the new MANHATTAN and WASHINGTON, and with the popular one-class ship of the American Merchant line. These six vessels have the distinction of doing so well in the lean years that there is scarcely room for improvement when the upturn came.

"But the improvement was there, and it continues well into the late summer season, always regarded *as* the doldrums for eastbound travel. As this is written, (about Aug. 10) the WASHINGTON is Europe bound with almost as large a list as she carried on her peak load."

Complete passenger figures for the MANHATTAN and WASHINGTON, since these vessels began service up to Aug. 14, are: Total eastbound, 27,046 and total westbound, 27,460. This is a very fine record, considering that the MANHATTAN sailed on her maiden voyage from New York on Aug. 11, 1932, and the WASHINGTON, on May 10, 1933.

On the mid July voyage the Panama Pacific liner CALIFORNIA landed 640 passengers at Los Angeles, the largest intercoastal list for that port in a number of years.

Two bids were received by the shipping board bureau for purchase of the steel cargo vessel REMUS. A bid of $9250 was offered for the vessel for scrapping purposes by the Northern Metal Co. Inc., Philadelphia. A bid of $65,000 was presented by the Gulf Pacific Mail Line Ltd., San Francisco, for operation of the vessel for five years on ocean mail route.

Passenger Travel Increase, Capacity Sailings

According to Herman Muhlenbrock, general passenger agent of the combined Hamburg-American line and the North German Lloyd, the increase in passenger bookings to Europe on German liners indicates an end to the depression which has affected all steamship lines in the last few years. Since the beginning of May, practically every sailing of the combined German lines has been a capacity one, a condition which has continued right up to the present time.

The S. S. NEW YORK, sailing from New York on July 25, carried 656 passengers, the largest number of passengers on this class of ship in five years at this particular time. This figure represents an increase of 94 per cent over the corresponding sailing of this ship last year.

According to Capt. Peter R. Vaughan, master of the Cunard-White Star motor liner BRITANNIC, on his arrival in New York Aug. 19, the new Cunarder No. 534 will be christened VICTORIA by Queen Mary sponsor at the launching Sept. 26.

Algonquin, Coast Guard Cutter Launched

THE United States coast guard cutter ALGONQUIN was launched July 25 at 11:30 a. m., at the shipyard of The Pusey and Jones Corp., Wilmington, Del. The new vessel was christened by Miss Marie Eleanor Ruggiero of Dorchester, Mass. Delivery of the ALGONQUIN has been set for Sept. 29.

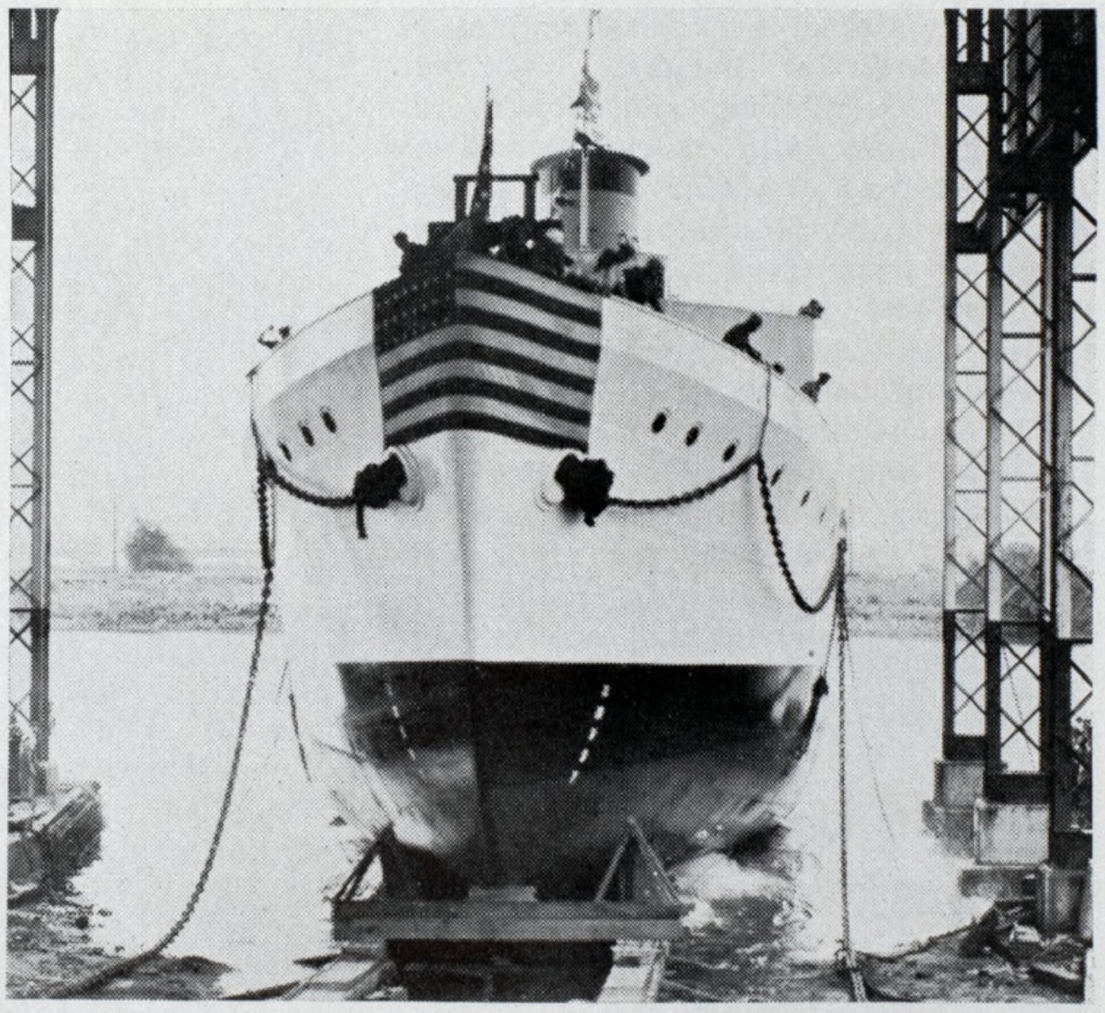
This is the first of three coast guard cutters of the ESCANABA type now under construction by The Pusey and Jones Corp. for the United States coast guard. Contract was awarded Oct. 26, 1933, at a bid of $499,800 for each vessel. The second vessel, the COMANCHE, is to be launched on Sept. 6 and delivery is set for Nov. 3. The third vessel, the MOHAWK, is to be launched on Sept. 23 and delivered Dec. 8.

As noted above, these vessels are similar to the ESCANABA, fully described and illustrated in MARINE REVIEW for January, 1933. There is, however, one important exception. The main propelling machinery and auxiliaries of the ALGONQUIN, COMANCHE and MOHAWK have been supplied by the Westinghouse Electric & Mfg. Co., while that of the ESCANABA was supplied by the De Laval Steam Turbine Co.

The propelling machinery consists of a geared steam turbine, connected to a single propeller shaft, developing 1500 horsepower. This power will give the vessel a speed of about 13 knots. Enough fuel can be carried to give an estimated steaming radius of 2000 miles. Steam is supplied by two Foster Wheeler water-tube marine boilers fitted with superheaters and burning oil.

The principal particulars of the vessels are: Length overall, 165 feet; length between perpendiculars, 150 feet; beam molded, 36 feet; depth molded, 21 feet; maximum draft, 13 feet. The displacement in salt water at about 12 feet mean draft is 1000 tons.

Two similar vessels named the ONONDAGO and TAHOMA are now under construction by the Defoe Boat & Motor Works, Bay City, Mich. The contract for these two was also awarded on Oct. 26, 1933, on bid of $563,800 for each vessel.



Coast Guard cutter ALGONQUIN, *launched July 25, at The Pusey and Jones Corp., Wilmington, Del. This is the first of three sister vessels under construction. The second will be launched Sept. 6 and the third Sept. 23*

Bremen Begins Sixth Year in Atlantic Service

The BREMEN, of the North German Lloyd line, sailed from Bremen for New York on July 27, beginning her sixth year of service. This date also marks the anniversary of her first sailing from New York in 1929.

During her five years of service, the BREMEN made 94 round trips across the Atlantic, covering a total of 690,000 nautical miles, equivalent to 32 trips around the globe. She carried 220,000 passengers, 1540 passenger automobiles, 3,247,000 cubic feet of express freight and large quantities of mail.

The BREMEN, third ship of this line to bear that name, entered service in 1929, sailing from Bremen on July 16 and making a record run of 4 days, 17 hours and 42 minutes from Cherbourg to Ambrose lightship. It was while on this trip that the BREMEN made a run of 713 miles from one noon to the next, averaging a speed of 27.83 knots. She surpassed this record on her arrival at New York on Oct. 2, 1933, covering the 3081 miles beween Cherbourg breakwater and Ambrose lightship in 4 days, 15 hours and 48 minutes.

Her largest passenger list was on June 28, 1930 when she sailed with 2002 passengers, 581 in first class.

It is interesting to note the figures involved in one turn around of the vessel, in the time between her arrival and departure. The BREMEN, with a passenger list of over 2000 and over 10,000 pieces of baggage, required thirteen gangplanks and conveyors bridged from ship to shore. Ten thousand tons of water and oil were pumped into the tanks; provisions for outgoing passengers as well as 1000 members of the crew were taken aboard. All this was accomplished in a period of between 10 and 15 hours.

The schedule under which the BREMEN and her sister ship, the EUROPA, have been operating over a period of years calls for their departure from 12 to no later than 36 hours after arrival, which until up to the time of these two ships, was an unheard of feat in passenger shipping.

To Hold Lifeboat Race

The eighth running of the lifeboat race, to be held on Labor day, Sept. 3, under the auspices of the International Lifeboat Racing association, will get under way at 11:30 a.m. on the Hudson river two miles north of the George Washington bridge, according to John D. Reilly, president of the association.

The contest, in which already nine entries have been made, promises to be one of the most thrilling lifeboat races ever held. The course selected about two miles long, will afford an excellent viewpoint for the thousands of expected spectators and a new record is expected in this year's event, the former seven races having been held in New York bay off Bay Ridge.

Five nations will compete for the Robert L. Hague trophy, which last year was won for the first time by the crew of an American ship, the Standard Shipping Co. tanker W. C. TEAGLE led the way in record time.

L'Atlantique Insurance

Representatives of all the foreign insurance companies who held risks on the liner L'ATLANTIQUE have been called upon to pay their proportion of the amount involved, including interest at 6 per cent from March 15, 1933. The principal amounts to 26,700,000 francs.

These payments are called for in accordance with French legal procedure and as a result of the decision of the commercial court of Paris. The owner is the Compagnie Sud-Atlantique and a bank guarantee for repayment must be provided should the underwriters' appeal now pending is successful.

Naval Architects Meet

The Society of Naval Architects & Marine Engineers, cooperating with other engineering societies, held a joint meeting on the evening of Aug. 8 in the Engineering Societies building, 29 West Thirty-ninth street, New York city, to hear an address by Admiral J. M. Reeves, commander-in-chief of the United Stats fleet and to view official naval films. An informal dinner preceded the meeting. The subject of the address was "The United States Navy" and it was received with great interest.

Admiral Reeves holds the highest command afloat in the navy, one of the most powerful in the world. He is a graduate of the United States naval academy and started his career as an engineer, but later transferred to the line. For eminent and conspicuous duty as an engineer officer on the battleship OREGON on her historic voyage around Cape Horn to meet the Spanish fleet in Cuba, he was advanced in rank. For exceptional meritorious service during the World war, he received the navy cross.

Admiral Reeves graduated from the Naval War college, served as member of the staff and later as head of the tactics department. He then commanded and organized the air forces of the battle fleet. When he was second in command of the fleet, he was in charge of the battle force including battleship divisions, cruiser divisions, destroyer divisions, submarine divisions, and aircraft.

He is considered an outstanding officer of the United States navy and and rose to his present high position through sheer ability, hard work and devotion to duty.

Transportation Courses at New York University

With the opening of the fall term, New York university will inaugurate two new courses; one on transportation as it affects the shipper and the other on transportation services and rates. Both courses are to be conducted by H. E. Stocker, treasurer of the Newtex Steamship Corp., and associate editor of MARINE REVIEW.

Mr. Stocker is a graduate of the University of California and has had something over 20 years of practical experience in transportation, a good part of this with steamship companies. His experience in traffic and operating departments has included service with the Pacific Mail Steamship Co., McCormick Steamship Co., Munson Steamship Co., and the Newtex Steamship Corp.

Port Service to Ships

He has specialized in problems having to do with the port service to ships. Since February, 1929, Mr. Stocker has conducted the section in MARINE REVIEW devoted to cargo handling and dock management. He has also written numerous articles on materials handling problems and transportation matters for publications in other fields.

Among the technical societies to which he has contributed papers are: The Society of Naval Architects and Marine Engineers, Society of Terminal Engineers, and the American Society of Mechanical Engineers. His paper on *Cargo Handling and Stowage*, presented at the 1933 meeting of the Society of Naval Architects and Marine Engineers was received with widespread interest among shipping men.

Offer Yacht Race Cruises

An all-expense international yacht race cruise schedule, to leave New York every evening during the seven-day event aboard steamers of the Fall River line, has been arranged by the New England Steamship Co. Vessels will leave New York at 4:30 every afternoon, beginning Sept. 14 and 16 to 21 inclusive, sailing by the sound route to Newport and the starting point, where they will join the spectator's and press flotilla in a cruise of the 30-mile triangular course, following the contestants at sea. The vessels will then return to New York the following morning with the loss of only one actual business day.

Two nights and a day aboard the steamers with meals and stateroom accommodations for the trip, as well as a close-up of the races over the entire course are included in the all-expense cruise. Special facilities will be provided on the decks of the steamers for a comfortable and unobstructed view of the races.

Italian Line Sailings, Cruises Planned

On Aug. 2, the CONTE DI SAVOIA of the Italian line arrived in New York from Naples, Genoa, Nice and Gibraltar with 1137 passengers, and sailed on Aug. 4 on her return trip.

The SATURNIA sailed from New York on Aug. 11 for Lisbon, Gibraltar, Algiers, Naples, Palermo, Piraeus, Bari, Venice and Trieste with 750 passengers. After leaving New York, she made a stop at Boston. While in mid-ocean, eastbound on this trip, the SATURNIA had the distinction of taking on board a government official and party from a Portuguese cruiser, and then proceeding to Lisbon which is a regular port of call. According to the officials of the Italian line, this is the first time in history that such a transfer of passengers has been made in mid-ocean on the southern route to Europe.

On Aug. 15, the REX arrived in New York from Naples, Genoa, Nice and Gibraltar with 1465 passengers.

Four cruises have been scheduled during the coming winter and spring, to the Mediterranean, Holy land and Egypt, using the CONTE DI SAVOIA, the REX, CONTE GRANDE and SATURNIA. Two West Indies cruises have also been arranged for the VULCANIA and SATURNIA.

CONTE GRANDE, sailing on Jan. 26, 1935 from New York, will be the first of the four vessels to depart on the Mediterranean cruise, followed by the CONTE DI SAVOIA on Feb. 13; the REX on Feb. 27 and the SATURNIA on March 27.

The REX sailed from New York Aug. 18 for Gibraltar, Naples, Nice, and Genoa with 900 passengers. It was on Aug. 16, 1933 that the REX, flagship of the Italian line, passed Ambrose Light, 27 hours ahead of her regular schedule, having completed the 3181-mile from run from Gibraltar in four days, 13 hours, 58 minutes, with an average speed of 28.92 knots for the crossing. The REX also beat the best time made on an eastbound crossing, 4 days, 16 hours, 15 minutes, with an average of 28.51 knots. Eastbound records are faster than westbound.

Postmaster General Calls Mail Contract Inquiry

On July 25 thirty two companies holding ocean mail contracts and four holding air mail contracts were notified by Acting Postmaster General W. W. Howes to appear at the post office department in Washington on Oct. 1 to show cause why mail contracts held by them should not be modified or cancelled. This is in accordance with the executive order issued by President Roosevelt on July 11 directing the postmaster general to conduct such an investigation and to report on his findings on or before Jan. 1 next.

The procedure to be followed at the hearings has not yet been worked out. In his letter to the mail contractors, the acting postmaster general said: "At these hearings such evidence as may then seem pertinent concerning your contract will be considered; and if any information in writing is required of your company before the date of said hearing you will be duly notified."

French Line's New Terminal at Havre

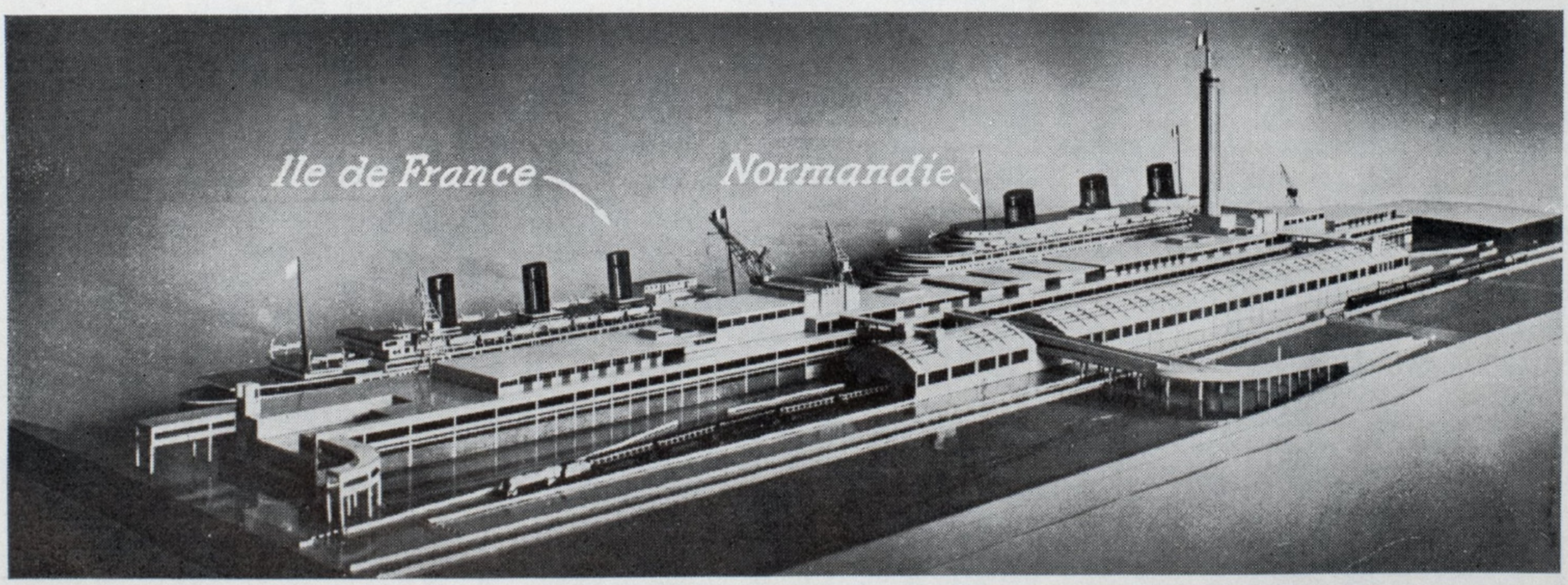
THE French line's new marine terminal at Havre, one of the most gigantic passenger and freight port terminals of its kind in the world, has been completed, and its formal opening is about to take place. The station is 1897 feet—well over a third of a mile—in length, 148 feet wide, covers an area of five acres, and its construction required 953,370 cubic feet of concrete, 4800 tons of steel and 9700 tons of cement. It was planned for greatest convenience and utility.

Every possible modern mechanical device has been installed, which will result in saving much time in embarking and disembarking passengers, loading and unloading cargo. All facilities are in duplicate, each side being a complete unit in itself, the purpose of the builder being that two ships can be handled at the same time without interfering in the slighest with each other.

The great passenger halls are provided with news-stand; tobacco shop, florist, telephone-telegraph and cable office, post office and bar. Escalators, elevators and broad staircases expedite the passage from ship to the boat trains, right in the building. Ramps provide automobile circulation on three floors of the structure.

The 280-foot tower of the terminal will be visible far out in the Bay of Havre. The side facing the sea will have a device, luminous at night, which will show the movement of the tide.

The French line and the State railway have combined in this project to further improve their service to their patrons. Among the features indicated in the accompanying illustration of a scale model of the new terminal are: both the NORMANDIE (scheduled to enter service June 1, 1935) and the ILE DE FRANCE at berth; special State railway boat trains for Paris leaving the train-shed; motor ramps which provide automobile circulation on three floors of the structure; and the 280-foot clock-tower, mentioned above.



Scale model of French Line's new terminal at Havre. The Normandie and Ile de France at berth

Late Decisions in Maritime Law

Legal Tips for Shipowners and Officers

Specially Compiled for Marine Review
By Harry Bowne Skillman
Attorney at Law

FAILURE of executors to comply with a clause in a passenger ticket that notice of claim for death of passenger must be given to the shipowners within ten days after termination of the voyage, which expired shortly before the executors enjoyed the legal status which would enable them to assert the claim and bring action, was not a bar to the action, it was decided in the case of EUROPA, 6 Fed. Supp. 686, since the notice clause was unreasonable and impossible of fulfillment.

* * *

SEAWORTHINESS, said the court in the case of Spencer Kellogg & Sons v. Buckeye Steamship Co., 70 F. (2d) 146, does not comprehend the best form of construction, or perfection in condition, but only that the vessel be so staunch and strong as to resist the ordinary actions of the sea during the voyage without damage or loss of cargo. Thus the standard by which it is to be determined is whether the vessel is reasonably fit to carry the cargo which she has undertaken to transport considering the ordinary perils to be anticipated in the voyage.

* * *

WHERE the entire cargo carrying capacity of a barge was chartered, the barge was a private carrier and its liability was determinable by the rules governing the responsibility of bailees upon proof of delivery to a bailee in good order and condition and delivery by the bailee in bad order, there is a presumption of the bailee's negligence, and the latter must come forward and explain the cause of the damage and that it was not due to negligence on its part. Failure of the private carrier in the instant case to explain the presence of seawater in the barge placed on it liability for damages sustained.—JOSEPH J. HOCK, 70 F. (2d) 259.

* * *

TUGS are responsible for the make-up of their tow; hence, are liable for damages thereto because of failure to make it up in such manner as to withstand usual swells in waters wherein it is navigating.—JULIA C. DAVIN, 70 F. (2d) 268.

* * *

THE shipowner is under a duty to furnish medical aid to a seaman who suffers injury or becomes ill in the service of the ship, and damages for neglect of this duty may be recovered in a proceeding in rem. Except in the face of danger to the ship or other emergency, it was declared in the case of POINT FERMIN, 70 F. (2d) 602, to require an injured or sick seaman to perform work substantially detrimental to his condition is in effect to fail and refuse to provide that care and attention to which he is entitled under the law.

* * *

WHERE a seaman is discharged in a foreign country by a consular officer on his complaint that the voyage is continued contrary to agreement, or that the vessel is badly provisioned or unseaworthy, or against the officers for cruel treatment, it is the duty of the consul or consular agent, after inquiry and upon being satisfied of the truth and justice of the complaint, to require the master to pay the seaman one month's wages over and above the wages due at the time of discharge and to provide passage home on some other vessel. Where a seaman, complaining that the crew had not been divided into equal watches, failed to obtain favorable action from the American consul in London on his complaint and thereupon deserted ship, he had no cause of action against the shipowner for the one month's extra wages and passage home.—AMERICAN SHIPPER, 70 F. (2d) 632.

* * *

IN DETERMINING whether due care was used by the master of a tug with barges in tow, much latitude ought to be allowed to the master who could get no bearings by eye or ear; however, failure to reduce speed in attempting to make for shelter of port and failure to cast lead for more than seven minutes in fewer than 30 feet of water and for about six minutes in fewer than 24 feet of water just preceding going ashore with the barges was negligence.—C. W. PATTERSON, 70 F. (2d) 712.

* * *

ONE asserting the defense of inevitable accident has the burden of proof to establish the fact by the clear weight of the credible evidence. To sustain this burden, the party alleging it must do one of two things; either must show what was the cause of the accident and that the result of that cause was inevitable; or must show all the possible causes, one or the other of which produced the effect; and must further show with regard to every one of these possible causes that the result could not have been avoided. The test of inevitable accident is met when, first, the cause of the accident is disclosed within the limits of the most reliable expert knowledge peculiar to the given art, and, second, when it is conclusively shown that with the exercise of reasonable care, based upon such knowledge, the accident did nevertheless in fact occur.—BEACON, 6 Fed. Supp. 779.

* * *

TUG owner engaged to tow scows is not an insurer of the scows, but is charged with the duty of exercising reasonable care while they are in his custody. * * * The mere fact that the tow was in good order when received by the tug and in damaged condition when redelivered by it does not raise the presumption of neglience against the tug. * * * It is the duty of a tug master, who adds his tow to a moored flotilla, to inspect the lines with respect to their ability to bear the added weight under conditions of tide and weather which are to be anticipated.—VENUS, 6 Fed. Supp. 950.

* * *

A CARRIER which has been guilty of deviation becomes an insurer for any damage suffered by the cargo, and it is wholly immaterial whether the deviation had any cause or connection with the damage caused to her cargo. If the cargo was in good order and condition when the deviation occurred, the ship must answer for its subsequent damage.—IDA, 6 Fed. Supp. 992.

* * *

WHEN a derelict is discovered on the high seas and it is salved, the salvors have a right of possession in the nature of a lien until they have been reimbursed by the owner, but the salvor does not acquire absolute title good against the owner.—PORT HUNTER, 6 Fed. Supp. 1009.

* * *

IN ORDER to limit his liability, a charterer of a vessel must surrender the vessel and the freight pending at the end of the voyage, or its value.—FORT BRAGG, 6 Fed. Supp. 13.

Marine Business Statistics Condensed

Record of Traffic at Principal American Ports for Past Year

New York

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1934	313	1,686,825	295	1,574,395
June	239	1,696,804	324	1,785,815
May	291	1,597,233	316	1,662,711
April	288	1,599,185	274	1,477,492
March	302	1,706,307	313	1,757,221
February	265	1,481,004	267	1,508,905
January	266	1,649,590	284	1,629,438
December	263	1,496,477	291	1,576,199
November	243	1,257,443	277	1,452,269
October, 1933	278	1,573,534	268	1,487,369

Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1934	48	125,616	35	89,902
June	61	191,042	53	155,308
May	58	169,719	50	143,652
April	67	199,032	48	147,083
March	59	162,480	48	140,311
February	42	129,940	36	109,973
January	45	139,259	47	133,427
December	54	175,715	45	135,969
November	47	144,111	40	119,896
October, 1933	68	186,588	51	152,700

Boston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1934	136	374,494	112	392,586
June	125	337,627	105	316,594
May	105	301,785	82	245,571
April	86	309,725	58	227,404
March	88	304,604	64	259,406
February	71	247,077	46	162,542
January	97	330,320	60	225,075
December	84	303,806	52	236,871
November	90	323,540	62	230,969
October	96	335,488	60	210,010
September, 1933	110	348,981	80	279,531

Portland, Me.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1934	14	27,034	12	26,525
June	15	30,296	16	43,232
May	15	27,376	15	32,378
April	14	20,555	15	20,572
March	13	33,399	13	33,399
February	11	27,213	11	27,213
January	9	22,908	10	25,570
December	13	31,801	13	32,589
November	15	29,335	18	35,579
October, 1933	14	27,953	14	32,913

Providence

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
June, 1934	8	14,773	4	4,887
May	3	4,985	1	2,022
April	3	4,985	1	2,022
March	5	17,973	2	7,422
February	7	20,959	2	6,882
January	2	7,694	....	.....
December	5	5,089	2	8,350
November	3	8,568	4	12,794
October	4	13,606	4	9,730
September, 1933	2	4,430	5	13,279

Portland, Oreg.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1934	12	46,946	11	39,730
June	10	34,726	1	2,298
May	11	41,765	17	58,993
April	31	117,094	42	157,954
March	32	121,085	50	186,817
February	25	95,774	52	198,593
January	32	116,610	50	188,401
December	31	119,833	51	184,646
November	29	108,890	35	130,457
October	26	102,926	46	173,030
September, 1933	25	97,576	38	141,839

Baltimore

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1934	108	319,702	106	317,583
June	108	339,280	112	356,445
May	104	329,312	107	328,998
April	102	300,396	108	334,583
March	92	288,061	88	273,131
February	77	261,122	77	263,236
January	78	256,942	80	265,681
December	94	298,001	92	286,746
November	90	270,023	88	267,784
October	88	284,997	90	289,864
September, 1933	85	273,994	84	270,189

Norfolk and Newport News

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1934	25	76,320	33	91,111
June	39	91,293	57	127,068
May	31	71,706	50	103,737
April	21	65,701	47	125,291
March	23	64,469	60	151,360
February	16	47,708	41	102,933
January	22	68,930	41	112,922
December	17	57,307	42	119,186
November	19	55,692	49	115,584
October, 1933	16	56,239	49	125,591

Jacksonville

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1934	18	16,470	16	18,145
June	16	21,226	18	30,898
May	14	13,340	22	38,824
April	10	10,464	7	12,164
March	9	16,338	9	11,193
February	8	10,900	11	20,348
January	7	13,017	10	22,508
December	8	15,083	11	22,837
November	8	13,405	8	19,108
October, 1933	11	24,365	6	8,893

Key West

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1934	25	24,469	25	25,564
June	28	33,701	25	32,548
May	40	57,180	42	58,094
April	28	36,197	21	36,066
March	24	38,052	23	37,658
February	23	36,476	24	36,523
January	25	39,966	22	38,764
December	22	38,764	22	38,764
November	23	33,556	22	31,330
October, 1933	22	37,180	23	39,878

Mobile

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1934	102	221,011	99	225,308
June	119	254,040	115	237,054
May	115	255,503	114	253,294
April	113	254,839	103	239,371
March	115	275,629	129	309,123
February	115	268,707	112	251,232
January	118	282,972	125	298,570
December	123	279,151	109	253,209
November	114	260,755	114	249,344
October, 1933	118	247,474	124	297,436

Seattle

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1934	24	93,558	20	82,646
June	16	73,128	12	52,309
May	22	103,441	19	86,295
April	62	264,608	67	278,172
March	52	203,796	51	205,371
February	54	226,118	62	251,281
January	52	221,000	55	230,995
December	54	225,842	60	246,987
November	54	222,914	51	211,474
October, 1933	58	253,865	59	254,959

New Orleans

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1934	156	439,297	154	423,642
June	141	300,349	151	416,734
May	167	482,123	152	421,839
April	169	487,655	170	475,121
March	155	422,855	166	449,394
February	151	446,952	145	414,515
January	146	423,759	145	414,918
December	139	398,112	152	443,496
November	148	439,238	152	430,631
October	154	467,332	169	506,324
September, 1933	154	443,981	168	470,271

Charleston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1934	41	99,233	34	81,362
June	36	95,072	31	81,094
May	36	98,475	23	69,764
April	38	101,315	34	96,705
March	44	131,839	37	109,492
February	40	112,884	39	109,597
January	23	60,138	25	66,827
December	35	111,420	32	97,473
November	43	123,628	39	109,151
October, 1933	34	97,585	33	91,526

Galveston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1934	21	33,508	60	163,282
June	25	57,920	71	215,594
May	21	34,457	56	141,885
April	27	50,294	82	219,283
March	29	54,379	94	264,101
February	22	41,945	77	236,784
January	23	43,664	86	252,595
December	19	40,552	90	279,537
November	16	37,590	85	262,800
October	21	44,388	104	304,402
September, 1933	10	19,602	94	277,642

Los Angeles

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1934	198	710,210	186	755,686
June	201	743,198	186	738,880
May	200	754,695	197	738,307
April	186	696,716	167	679,883
March	168	669,548	169	691,230
February	154	629,859	165	624,170
January	176	686,201	146	616,189
December	169	639,444	164	629,462
November	143	539,624	162	592,724
October, 1933	160	623,572	152	592,212

San Francisco

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1934	118	484,655	119	471,702
June	126	386,966	110	456,027
May	152	452,827	140	593,715
April	165	831,501	169	729,273
March	150	659,251	181	772,219
February	141	503,105	154	659,366
January	163	722,800	197	764,823
December	137	616,820	172	739,604
November	144	619,874	182	806,020
October, 1933	169	753,650	168	717,133

Houston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
June, 1934	27	115,730	33	133,108
May	29	109,223	45	132,318
April	31	121,318	40	155,327
March	23	89,200	39	144,546
February	22	88,094	26	99,931
January	23	88,164	37	128,773
December	18	65,566	31	109,206
November	14	49,486	30	106,943
October	28	105,818	41	151,872
September, 1933	20	70,827	27	89,893

Note: At the port of Philadelphia, additional vessels in the foreign trade (via other American ports) were 55 of 186,625 net tons entered and 55 of 214,609 net tons cleared for the month of July.

Latest Data on New Marine Work

Information on New Ships Ordered—Building and Repair Contracts Let — Sales — Reconditioning — Launchings — Trial Trips

ON JULY 23, Gibbs & Cox Inc., naval architects, New York, received bids for elaborate reconstruction of the steamships HENRY S. GROVE and CHARLES H. CRAMP of the American South African line. The low bid was $1,052,081 for both vessels, or $526,041 for one vessel, from the Maryland Dry Dock Co., Baltimore, Md. It was stipulated that the first vessel would be delivered in seven months and the second in eight months.

Bids were received from five additional companies and were as follows, for both vessels: Newport News Shipbuilding & Dry Dock Co., $1,172,000; Todd Shipyards Corp., $1,282,832; Federal Shipbuilding & Dry Dock Co., $1,262,554; Sun Shipbuilding & Dry Dock Co., $1,126,000; and United Dry Docks Inc., $1,550,000.

These vessels were built 13 and 14 years ago, respectively, at William Cramp & Sons Ship & Engine Building Co., Philadelphia, and each has a gross tonnage of 6220. They are 404 feet 6 inches in length, 53 feet 10 inches in beam, and 36 feet 9 inches in depth.

The vessels are to be rebuilt to accommodate 42 passengers. Speed will be increased by the addition of Bauer-Wach turbines to at least 13 knots so as to come within requirements of the mail contracts. The present propelling machinery is one 4-cylinder, 25½ x 37 x 52½ x 76 inches and 54-inch stroke, reciprocating steam engine. Steam is supplied by four Scotch boilers.

Lighthouse Tender Bids

In the bids received in Washington on July 23 by the commissioner of lighthouses for the construction and delivery of one twin screw, steel hull, diesel engine propelled tender for the eighth lighthouse district, New Orleans, the Dravo Contracting Co. was low bidder with a bid of $114,850. The new vessel is to be known as the JASMINE. Her general dimensions are: Length extreme, 91 feet, 6 inches; length overall, molded, 90 feet; length between perpendiculars, 82 feet; beam molded, 23 feet; and depth at side, 8 feet, 3 inches. The propelling power in twin screws is to be diesel engines each of 100 shaft horsepower at 400 revolutions per minute.

Other bids received were: Marietta Mfg. Co., $160,000 with minor additions and deductions for alternate proposals; the Pusey & Jones Corp., $148,000; Manitowoc Shipbuilding Corp., $133,000 with minor additions and deductions for alternate proposals; Defoe Boat & Motor Works, $129,500 with certain deductions and additions for alternate proposals; and Maryland Dry Dock Co., $125,685.

Contract for building the JASMINE was awarded to the Dravo Contracting Co., Pittsburgh.

Launch Naval Dry Dock

The floating dry dock under construction by the Dravo Contracting Co. at its Wilmington, Del., yard for the United States navy, was launched on Aug. 15.

Bids for the construction of this floating dry dock were opened on March 9, 1933, and the Dravo Contracting Co. was low with a base bid of $278,200. The complete cost will be $352,680.

After being towed to the Philadelphia navy yard, where acceptance tests are to be made and equipment furnished by the navy installed, this dry dock will be towed to San Diego, Calif., where it is to be stationed for the accommodation of naval craft of less than cruiser size.

The dry dock is of all steel construction and the dimensions are 361 x 60 x 34 feet.

Bids for Diesel Engine Received by Engineers

On July 24 bids were opened at the United States engineer office, Louisville, Ky., for furnishing one 1600 horsepower diesel engine. The Busch-Sulzer Bros. Diesel Engine Co., St. Louis, submitted the lowest bids, $66,500 on proposition No. 1 which included oil coupling and accessories, and $54,400 for proposition No. 2 which included thrust bearing but no oil coupling. Other bids received were: Nordberg Mfg. Co., Milwaukee, Wis., for proposition No. 1, $78,510, and no bid on proposition No. 2; Electric Boat Co., Groton, Conn., for proposition No. 1, $133,000, and no bid on proposition No. 2; McIntosh & Seymour Corp., Auburn, N. Y., for proposition No. 1, $75,092 and for proposition No. 2, $64,682.

Service charge for erecting engineer per day was $15 for Busch-Sulzer Bros. Diesel Engine Co.; $25 for Nordberg Mfg. Co. and Electric Boat Co.; and 20 for McIntosh & Seymour Corp.

The Busch-Sulzer bid on proposition No. 2 included a Francke flexible coupling, the same as is now installed on the pump to which the new engine will be connected. If the coupling now installed is reused the bid is reduced to $53,300.

In the case of the Nordberg Mfg. Co. bid an alternate hydraulic coupling which cannot be disconnected is offered in lieu of the one complying with the specifications, at a reduction of $3471 from the bid price. The same company also offers two Northern lubricating oil pumps in lieu of Viking for an addition of $694 to the bid price, and one Northern lubricating oil pump for the hydraulic coupling in lieu of Viking for an addition of $258 to the bid price.

To Launch Third Vessel

The CYANE, third and last of the three coast guard cutters under construction at the yard of the Lake Union Dry Docks & Machine Works, Seattle, is scheduled for launching Sept. 1 and for delivery Oct. 29, completing the contract within the specified time.

As reported in the July MARINE REVIEW, the first of these three vessels, the ATALANTA, was launched on June 16, and is scheduled for delivery on Sept. 19. The second vessel, the ARIADNE, was launched July 21 and is scheduled for delivery Oct. 9. The entire program has been carried out promptly and to the satisfaction of the engineers representing the lighthouse department.

In launching, the vessels were hauled from the ways on to the floating dry dock and were then waterborne by submerging the dock. These patrol boats are sister vessels of the three building at the Manitowoc Shipbuilding Corp. and the three under construction by the Marietta Mfg. Co. They are 165 feet in length, and are fitted with twin screws, each driven by a Winton diesel of 650 horsepower.

The United States lighthouse tender HEMLOCK, recently completed by the Berg Shipbuilding Co., Seattle, and fully described in the August MARINE REVIEW, sailed from Seattle on July 30 for her station at Ketchikan, Alaska, after having been officially accepted by the lighthouse bureau. Her commander is Capt. W. H. Barton.

Lease Army Base Piers at Philadelphia, Norfolk

The acting director of the shipping board bureau, James Craig Peacock, announced on July 24 that Acting Secretary of Commerce Dickinson had approved the award of the lease to operate the Philadelphia army base terminal at Philadelphia to Philadelphia Piers Inc., at an annual rental of $162,500. The administration of the terminal property is under the direction of the United States Shipping Board Merchant Fleet Corp.

Bids for the operation of the Philadelphia army base terminal were opened in Washington on July 9 and Philadelphia Piers Inc. was the high bidder. The lease covered a period of five years.

Word has also been received from the acting director of the shipping board bureau, that Secretary of Commerce Roper, on Aug. 1, approved the award of the lease to operate the Norfolk army base terminal to Norfolk Tidewater Terminal Inc., Norfolk, Va., at an annual rental of $160,000.

Bids for the operation of the Norfolk army base were opened on July 16, 1934, and Norfolk Tidewater Terminals Inc., the present lessee, proved to be the high bidder. The lease covers a period of five years.

On Aug. 1, bids were opened at the United States engineer office, Memphis, Tenn., for the construction of one 65-foot steel anchor barge. This barge is to have a length overall of 65 feet, 9 inches and a beam overall of 20 feet, 9⅛ inches.

Launch Lighthouse Tender

The single screw diesel electric propelled lighthouse tender TAMARACK, under construction by the Manitowoc Shipbuilding Corp., Manitowoc, Wis., for the bureau of lighthouse, was launched Aug. 21. The sponsor was Miss Lane Egan.

The principal dimensions of the new vessel are length overall, 124 feet, 2¾ inches; length on the designed waterline, 111 feet, 8 inches; beam molded, 29 feet; and minimum depth at side, 10 feet. Displacement in fresh water at 7 feet molded draft is about 400 tons. A 450 horsepower electric motor, direct connected to a single propeller will drive the vessel at a speed of 10¼ knots. Electric current for this motor is developed by two diesel engine-driven generators.

Boiler Drums for Cruisers

Word was received on Aug. 15 from the Combustion Engineering Co. Inc., 200 Madison avenue, New York, that this company has been awarded contract by the navy department for boiler and superheater drums and appurtenances for the cruisers BROOKLYN and PHILADELPHIA.

This contract includes a total of 64 welded drums and also contains an option for similar equipment for one, two or three additional vessels. The cruiser BROOKLYN is under construction at the navy yard, New York, and the cruiser PHILADELPHIA is under construction at the navy yard, Philadelphia. The boilers will be built at the respective navy yards.

To Start Reconditioning

The Johnson Iron Works, New Orleans, will on Aug. 30 begin reconditioning in turn the METAPAN, SIXAOLA, and ZACAPA of the United Fruit Co. fleet, at an approximate cost of $600,000.

A very complete overhaul is to be given the ships including machinery. Passenger quarters will be thoroughly renovated and improved. The Todd Engineering & Dry Dock Co., New Orleans, will share in the work. Each vessel will take its turn at the repair yard.

The heavy cruiser TUSCALOOSA, recently completed by the New York Shipbuilding Co., Camden, N. J., was scheduled to be placed in commission at the Philadelphia navy yard, Aug. 18. Her commander is Capt. John N. Ferguson, U. S. N., who had been in charge of her fitting out.

Plan Five Large Ships for Intercoastal Trade

Represented by Angelo Conti, New York naval architect, it is understood that the Atlantic-Pacific Transport Corp. has filed an application with the shipping board bureau for a loan to aid in the building of five 12,500-ton refrigerated ships to operate between West coast ports and New York. Eastbound the vessels will specialize in carrying fruit, and westbound will take general cargo.

The new ships are to have a speed of 18 knots and 350,000 cubic feet of refrigerated cargo capacity. Fifty round trips a year are planned between San Francisco and New York via Los Angeles and San Diego. The one-way voyage would take 14 days.

Plans call for the completion of the first vessel late in 1935. The total cost of the five vessels is estimated at $12,000,000. Of this amount 75 per cent, it is understood, is requested from the shipping board as a loan, the company providing the first 25 per cent of the outlay necessary.

The shipping board is giving consideration to the request for the loan. On the grounds that there is no need for such a service the granting of the loan is being opposed by several railroads and intercoastal vessel companies. It is held that this route is already served by too many ships.

Bids for Two Board Ships

Bids were opened Aug. 9 by James Craig Peacock, acting director of the shipping board bureau, department of commerce, for the purchase for restricted operation of the steel cargo ships EVERGREEN CITY and NACATA. The only bidder was the Texas Co, New York city with an offer of $50,000 for both or $25,000 for each vessel.

The vessels were built under the shipping board's wartime construction program and are sister ships of 8727 tons deadweight. The EVERGREEN CITY was built in 1920 and the NACATA in 1921 by the Merchant Shipbuilding Corp. Both are in the government laid up fleet at New Orleans.

Bunker Prices

At New York

	Coal F. o. b. per ton	Fuel oil alongside per barrel	Diesel engine oil alongside per gallon
Aug. 18, 1934	5.63@5.48	1.35	4.79
July 19	5.63@5.48	1.35	4.79
June 19	5.63@5.48	1.35	4.79
May 18	5.63@5.48	1.35	4.79
April 19	5.63@5.48	1.35	4.79
Mar. 19	5.35@5.20	1.25	4.79
Feb. 19	5.35@5.20	1.25	4.79
Jan. 18	5.35@5.20	1.25	4.79
Dec. 18	5.35@5.20	1.25	4.79
Nov. 18	5.35@5.20	1.15	4.70½
Oct. 18	5.00@5.75	1.15	4.70½
Sept. 18, 1933	445@4.75	1.15	4.70

At Philadelphia

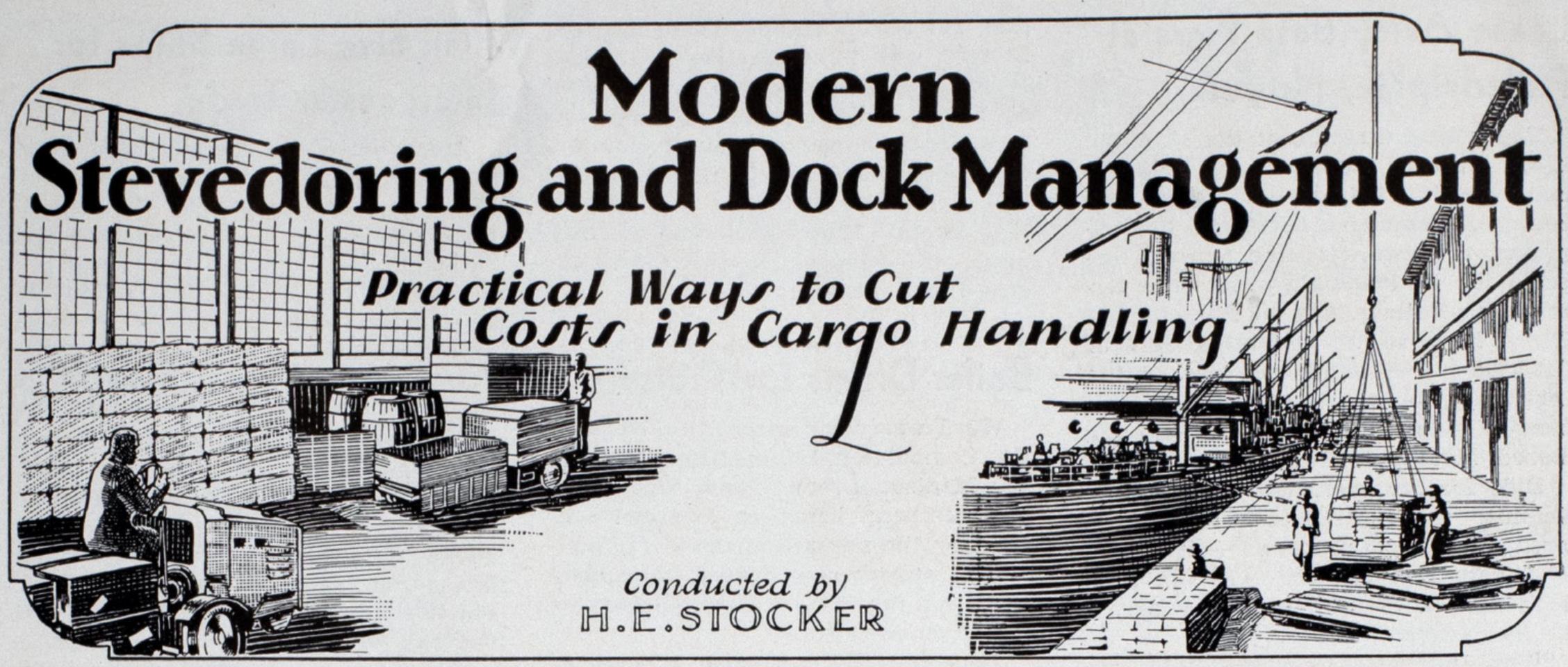
	Coal trim in bulk per ton	Fuel oil alongside per barrel	Diesel engine oil alongside per gallon
Aug. 18, 1934	4.93@4.78	1.35	4.76
July 19	4.93@4.78	1.35	4.76
June 19	4.93@4.78	1.35	4.76
May 18	4.93@4.78	1.35	4.76
April 19	4.93@4.78	1.35	4.76
Mar. 19	4.65@4.50	1.25	4.76
Feb. 19	4.65@4.50	1.25	4.76
Jan. 18	4.65@4.50	1.25	4.76
Dec. 18	4.65@4.50	1.15	4.76
Nov. 18	4.65@4.50	1.15	4.76
Oct. 18	5.00@5.75	1.15	4.76
Sept. 18, 1933	4.45@4.75	1.15	4.88

Other Ports

Aug. 18, 1933

Boston, coal, per ton	$8.00
Boston, oil, f. a. s. per barrel	$1.25
Hampton Roads, coal, per ton, f.o.b. piers	$5.00
Cardiff, coal, per ton	13s 6d
London, coal, per ton	—s —d
Antwerp, coal, per ton	16s 6d
Antwerp, Fuel oil, per ton	—s —d
Antwerp, Diesel oil, per ton	—s —d
British ports, Fuel oil	—s —d
British ports, Diesel oil	—s —d

Note: Figures given for coal at New York and Philadelphia are for Classes A and B according to the Code; Class C is slightly less.



Truck-Pallet Method of Cargo Handling Found Effective in Reducing Cost

By H. E. Stocker

THE fork truck—pallet method of cargo handling has proved an economical means of reducing costs on the Pacific coast and it has now begun to spread to other ports. Though referred to here as the fork truck pallet method, there is no standard nomenclature among stevedores and shipping men. Pallets are called flats, cargo boards and low skids and several other names.

A typical fork truck—pallet operation is found in the handling of boxed apples at Seattle.

A stevedoring company receives boxed apples by ventilated fruit express cars and by motor trucks. A gasoline fork truck brings stacks of pallets to the car door. When a pallet is loaded with 48 cases of apples, the fork truck lifts the load, backs out of the car and carries the cargo to shipside, where it is hoisted into the ship, using the pallet as a sling.

Advantages of this Method

If the ship is not in port, the pallets are piled two high on the pier. This system has cut stevedoring costs remarkably. Similar equipment is used by other stevedoring companies operating at Los Angeles harbor and Portland.

The fork truck—pallet method is advantageous because, large units of cargo may be handled quickly and economically, from motor truck or freight cars direct into the ships hold, or the same units may be piled two and three high on the dock quickly and economically and without damage to the cargo.

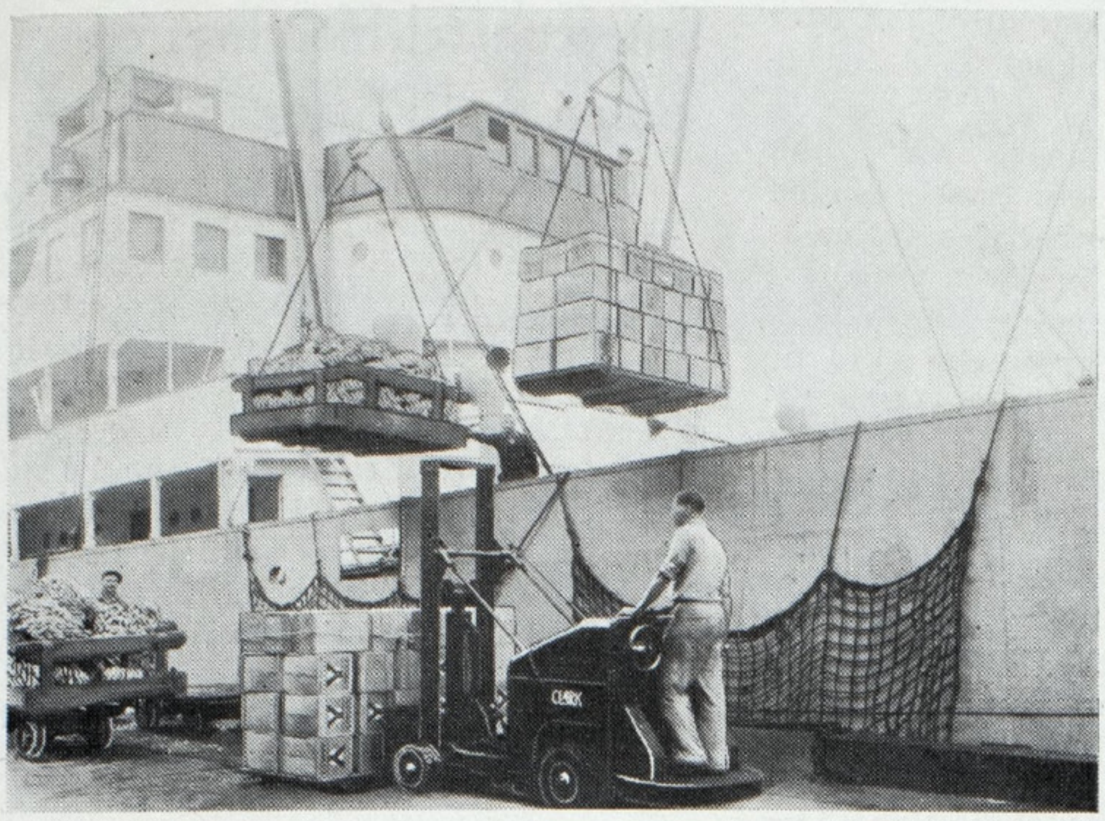
Essentially the fork truck—pallet method is an improvement of the lift truck—skid method of cargo handling. It is as if the skid with an underneath clearance of 6 to 12 inches had shrunk to an underneath clearance of 2½ to 4 inches.

This has brought a reduction in cost of equipment. As compared with a cost of $4 to $6 for the skid, pallets cost about $2.50 at Seattle. The pallet weighs less and is less combersome to handle and store when empty. When loaded pallets are stored, the pallet takes the place of dunnage saving both labor and material.

One stevedore uses pallets 48 inches x 70 inches. This gives a 24 inch load center on the forks which enter from the side of the pallet. The pallets are two sided so that no matter how it is placed, it is always right side up and the need of dunnage is eliminated to protect the cargo when piling loaded pallets two and three high.

The top and bottom boards are 1 x 6 inches lumber running lengthwise. These boards are separated by three scantlings, one on each side and one in the center. The space between the top and bottom boards for the inser-

AT Los Angeles—Three-ton fork truck handling two pallet loads of 5 drums each; weight about 5400 pounds. Load spotted under ship's sling. Frontman approaching to apply sling hooks



HOISTING pallet load of apples from fork truck into ship at Seattle. Note type of bridle sling used

tion of the forks is 2½ inches. The ends of the boards at the corners are incased in a steel fittings with a 45 degree angle projection. These projections are provided with two holes each, one above the other, for the hooks which are used in hoisting the pallets into the ship. The pallet is tied together with tie rods running lengthwise in the space between the boards forming the top and bottom.

When the pallets used have top boards only, the pallets are hoisted into the ship by a cradle type sling. The ropes are attached to an iron bar which engages the projecting ends of the pallet boards.

How Fork Truck Operates

The fork trucks have two steel fingers or forks, 45 inches long, 8 inches wide and 1¾ to 2 inches thick at the heel tapering to ¾ inch at the toe. The taper is on the under side of the fork. The length of the fork is sufficient to allow the end of the fork to support the outermost board of the pallet. After the forks are run under the pallet the load is lifted and tilted back to a safe carrying position. The load may be tilted 15 degrees back or 5 degrees forward. Tilting heights vary from 52 inches upwards, depending on the model of the truck.

Trucks arriving at the terminal with outbound cargo discharge on two pallets either at the back of the shed where a platform is provided for level movement of cargo from truck to dock floor, or if the motor truck goes inside the shed, the load is discharged on to a pile of empty pallets placed alongside the truck. When the top pallet is loaded it is removed by a fork truck and the truck gang loads the second pallet. When the pile of pallets gets low, the fork truck places additional empty pallets on the pile. This level handling of freight reduces damage and speeds the discharge of trucks, which at times is an important factor in reducing terminal congestion.

For long hauls the fork truck—pallet method is not economical, because only one or two pallet loads may be carried at one time, and the economy of long hauls requires a larger load than one truck can handle. Ordinarily, the next step would be to load the pallets on to trailers and haul two or more trailers at one time. However, with the high piling ability of the modern fork truck it is possible to pile cargo three pallet loads high, which increases the possibilities of the fork truck, because it does not have to travel so far to handle a given amount of cargo as when the cargo is piled man high.

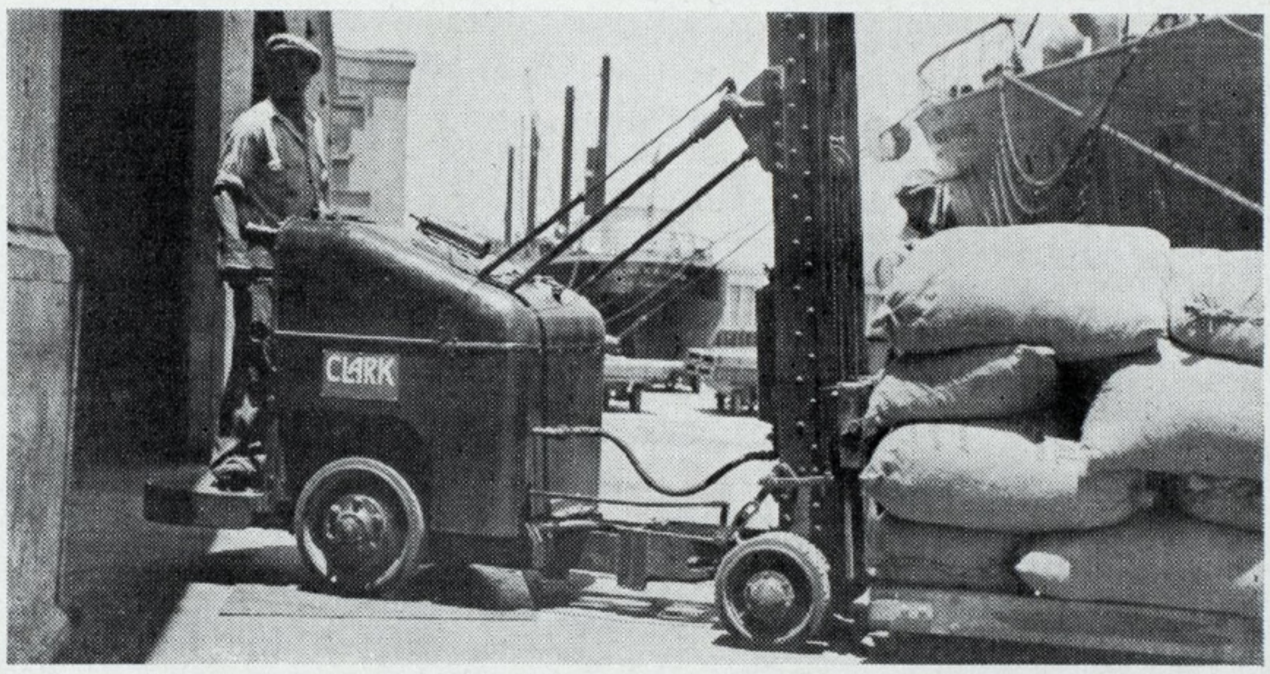
Heavy Load Carried

A Los Angeles stevedore moves two loaded pallets at a time, weighing 5600 pounds using a three-ton capacity fork truck. While the truck returns for another two loaded pallets, the first two loads are hoisted into the ship and empty pallets returned to the dock.

One of the illustrations shows a truck handling two pallets loaded with 5 drums each, total weight 5400 pounds. The average pallet load at Los Angeles is 2500 pounds.

When it is advantageous to shift cargo on the dock, cargo stored on pallets may be shifted quickly, economically, as contrasted with slow and expensive shifting when the cargo must be handled case by case.

Another advantage of the fork truck-pallet method as compared with the lift truck skid method is the small space required to store a large number of empty pallets. Also, because the truck can carry 20 to 30 pallets at one time, they can be distributed quicker than skids of which only a few may be handled in one



ABOVE—Lift truck handling 2650 pounds of sacked cargo at Los Angeles

AT right—Three-ton fork truck spotting a pallet load of 66 cartons of salad oil under ship's sling. Sling hooks being engaged for taking load over ship's side. Weight ordinarily lifted 2600 to 2800 pounds

trip.

In a sideport operation, the movement from dock to ship is continuous and therefore more economical than when the slingloads are hoisted overall. Furthermore, the fork truck which brings the cargo to the ship may be used to bring the load close to the point of stowage.

To obtain the maximum economy for all concerned in the handling of freight the shipping unit should be made up as far back in the plant operation as conditions will permit. In the paper industry for example, flat printing stock is put on skids within the plant and remains on skids until it passes on to the printing press at the final destination which in some cases is over 5000 miles away by the route traveled by the paper.

This method has proved very successful and has been extended to other commodities including fire brick and roofing slate. The same basic idea of handling commodities can be used for other commodities particularly when pallets and fork trucks are used.

Determine Best Stowage

Problems will be encountered in stowing loaded pallets in ships, but the possible economies of this method certainly warrant experiments to determine the best manner of stowage of different commodities which can be handled on pallets as well as determining the limitation of this way of stowing cargo. Purely theoretical objections at this stage of the development carry little weight when by a little experimentation facts supplant theories.

Shipping tinplate on skids or pallets is a comparatively recent development in materials handling which is very interesting and has resulted in savings to the manufacturers, the buyers, railroads and shipping companies. The manufacturer quotes list price on tinplate boxed. When shipped on pallets with more than a 4-inch underneath clearance a discount of 5 cents per cut is allowed; if shipped on pallets of less than 4 inches, the discount is increased to 10 cents. A manufacturer of tin products purchasing 60,000 pounds carload of tin plate, saves $60 by having it shipped on the 4-inch pallet.

One opportunity for economy is in the interchange of freight in large transportation centers. Rather than handling shipment between terminals package by package, on a motor truck or barge or by switching in box cars, shipments may be loaded on skids, cleatboards or trailers. In one case, six loaded skids are handled on a motor truck. These can be loaded in a fraction of the time necessary to load, and unload the 360 to 400 cases loaded on the six skids which make up a load. In another case a railroad loads trailers into box cars and switches them between terminals.

Because pallets cost less than skids and occupy less space loaded and empty, the return of empties is a less burdensome problem to solve. There is a broken point where it is just as cheap to throw the skid or pallet away at destination as to return it to point of origin. This point must be determined for each movement.

Many shipping men objected to transporting cargo on skids between ports because of the lost space under the skids. This objection is no longer of any weight, because taking into consideration that the pallet eliminates need of dunnage, the lost space is of little or no consequence and in many operations such little disadvantage that may exist with respect to lost space is offset by the other advantage of the fork truck-pallet method.

Pacific Coast Shipping

The chartering department of the General Steamship Corp. Ltd., San Francisco, in referring to the condition of Pacific coast shipping in a memorandum dated Aug. 1, makes the following observation:

Due to strike conditions prevailing at all United States Pacific coast ports, the month of July experienced almost a complete stoppage of business. The full cargo market suffered heavily as charterers and owners alike showed little or no inclination to speculate in chartering vessels for loading at United States ports.

The return of the longshoremen on July 31 after having agreed to arbitration is lifting a heavy pall of gloom and pessimism that has been prevalent since May 9, when the strike was first declared. It is now felt that shortly all the maritime unions on strike will follow the lead of the longshoremen, thus ending definitely one of the most costly of strikes on the Pacific coast.

Despite strenuous efforts of employers to avoid this disastrous strike by submitting the difference for arbitration, the radical element succeeded in defeating this effort, and thus prolonging the strike. However, apparently nothing has been gained that would not have been gained had the differences been submitted to arbitration in the first instance.

The shipping industry, as a whole, is too busy now in untangling the snarls caused by the disruption of business to make possible any prediction of immediate volume of business. It is expected, however, that there will be a resumption of considerable activity in chartering ships and booking berth space in all trades for future loadings.

Intercoastal Hearings on Rates and Practices

The hearings held in New York, on the rates and practices in the intercoastal trade were concluded on Aug. 15. M. G. Quevedo, examiner for the shipping board bureau, in charge of the hearings, notified representatives of the lines operating in intercoastal trade that the board would set a date and place for hearings on questionnaires which the carriers are to answer which have to do with their operations and financial arrangements.

During the hearings, which had begun on Aug. 6, many representatives of steamship lines, shippers, and Southern ports were heard at length on various phases of the intercoastal trade. The examiner will make his report to the shipping board bureau. It is likely that the bureau in turn will use this report as the basis for recommendations to congress for legislation which will give the bureau the authority to exercise control over the trade and to fix minimum rates.

The United States intercoastal conference, which had been in existence in one form or another and for various periods and which was disbanded on July 31 last, may now be revived. The hearings clearly showed that rate wars and chaos will prevail without some definite understanding and control over rate making. To avoid this it is, therefore, believed that the chances are now better for again reaching an agreement to operate under an intercoastal conference.

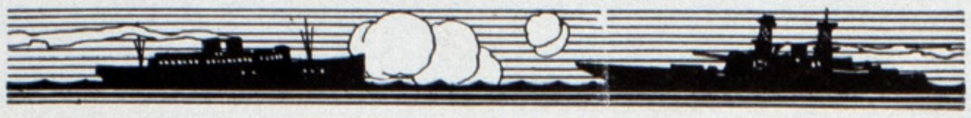
Clyde Mallory Line

The Clyde-Mallory line recently installed an outdoor swimming pool and special sun-bathing facilities aboard the S. S. SHAWNEE in addition to the already extensive "country club" advantages, including sports decks of varied interests. The liners MOHAWK and ALGONQUIN have also been similarly equipped.

These vessels sail from New York on nine and ten-day cruises to Miami Beach and a 13-day cruise to Texas via Miami Beach, the SHAWNEE sailing on Saturdays and the MOHAWK and ALGONQUIN on Wednesdays. Each voyage includes six days of cruising on these modern liners and from three to seven days ashore. All expense rates are offered by the line providing meals and stateroom accommodations at sea with meals and room at a hotel ashore.

The Electric Storage Battery Co., Philadelphia, Pa., has signed the code of the electric storage and wet primary battery industry, and will, therefore, in the future operate under the code's established regulations.

Useful Hints on Cargo Handling



A TECHNICAL interpretation of a stevedoring contract by either the contracting stevedore or the steamship company is not wise. The interpretation of the contract should be based upon a fair payment for work performed. A stevedore cannot perform work without cost and any "chiseling" tactics which force him to do so will be made up elsewhere.

The steamship company, on the other hand, cannot be expected to furnish slings or services without ultimately trying to get it back. The result of chiseling tactics is more chiseling and unethical practices. This is business warfare and in the long run like all warfare detrimental to the victor as well as the vanquished.

Cargo Handling Limitations

GENERALLY speaking, the greater the number of cargo openings, the greater the number of tons handled per hour. However, in specific instances, additional hatches or sideports are of no value. For example, at a sugar refinery at Crockett, Calif., the average tons per hatch hour is around 100 tons. Working two hatches at this fast rate keeps the warehouse conveying system busy and if cargo was discharged from additional hatches it could not be taken away from the ship.

In another case, the pier space is so limited, additional cargo openings would be of value only a small percentage of the time. In this case a more commodious pier is not available in the port district to which operations must be restricted.

Small Freight Containers

THE use of a small freight container is recommended for the following reasons:

1. It saves the shipper the cost of boxes, cartons, etc., both labor and material.

2. It saves the cost of labor of packing and handling merchandise.

3. It saves intra-plant handling cost, because containers can be loaded anywhere in shippers' plants instead of in shipping rooms only.

4. It saves freight charges, because they are based upon weight of content only, and the very light types of packing and wrapping can be used in containers.

5. It saves trucking cost, as small packages do not have to be rehandled and therefore trucks can be loaded and unloaded more quickly.

6. It saves loss of merchandise and reduces loss and damage claims, because goods in containers are not subjected to handling and containers can be securely locked.

7. It saves interest charges on shipments in transit, and it makes possible quicker deliveries and quicker collection.

8. It brings in new business by making possible the delivery of less-carload shipments of perishables to places not hitherto reached except by costly express or motor trucks.

9. It protects from cold all goods subject to damage from freezing in winter.

THIS page is being devoted to short items on all matters having to do with the more efficient turn-around of ships. These items are intended to be of a helpful nature.

We will welcome for this page brief descriptions, illustrated if possible, of any better or safer way of performing any function in cargo handling. Also, any questions submitted will be answered by the editor.

Efficient Type of Sling

A STEVEDORE has developed a new type of sling for handling bulk linseed which is 30 per cent more effective than the bucket sling used formerly. The sling is made of a piece of canvas 13 feet square, reinforced with rope. The linseed is simply pushed into the sling and the slingload hoisted away. On the dock the load is dumped by letting go one side of the sling.

Roller bearing blocks were ordered recently by a New York steamship line. This type of block should eventually replace all blocks with the ordinary type bearing. They are safer and maintenance costs are less.

Various types of grabs are available for hoisting barrels, bales, rolls of paper, also steel and aluminum ingots. They are built in capacities up to 30 tons and are both automatic and semi-automatic. The grab is more effective than a rope sling, for example, because of the quickness with which load can be picked up and dropped.

A large transportation company has recently ordered over 800 sets of rubber tires for its trailers which have been in use at one of its large terminals for some time.

At a Boston terminal discharge of trucks is expedited by using gravity roller conveyors. When part of the load is placed on the platform, the conveyor is used in handling the cases of freight to the tail of the truck, where they are placed on trailers.

In fine weather, wooden hatch covers are all right, but in stormy weather they are a source of anxiety to those on board and are constantly under inspection.—Holmes—*Practical Shipbuilding.*

Control of Pier Activities

MORE and more of the steamship companies are issuing definite written instruction to their checkers, in reference to receiving and delivering of various commodities, and eliminating the system of allowing the checkers to pick up their knowledge from time to time—mostly by trial and error.

Cleanliness of terminals is desirable and profitable. Cleanliness is organized salvage. However, when cleanliness is carried to the extent of fussiness it ceases to be anything but profitable.

One terminal superintendent was severely criticised for a dirty section on the terminal. The executive who did the criticising failed to ascertain if there were any reasons why the condition existed. If he had done so, he would have found that a carload of rice had been received from the section a few minute before and it was not practicable to clean the section such a short time later.

The best practices and results, not averages, should be known and emulated. It is fallacious to compare performances with averages. No distinct accomplishment in any walk of life is realized by so doing. The 100 yard runner does not endeavor to beat the average but the best time of record.

Up and Down the Great Lakes

Less Gain in Traffic—Lake Levels—Ore Shipments—
Canadian Grain—Coal—Fewer Vessels in Operation

TOTAL traffic through the Sault Ste. Marie canals, United States and Canadian, was somewhat lower in July than in June, but was very considerably in excess of July, 1933. Wheat shipments during July amounted to 16,668,150 bushels as compared with 28,154,413 bushels during June. Other grains, however, increased by 8 per cent or 417,071 bushels. Iron ore shipments were heavier by 186,516 tons. Total traffic during July amounted to 7,522,124 tons as compared with 7,901,370 tons in June and 6,050,248 tons during July, 1933.

Traffic through the Welland ship canal set a new high record for July, amounting to a total of 1,334,276 tons, exceeding last year's July traffic by 213,074 tons. Iron ore was heavier than in 1933 by 80,826 tons, bituminous coal by 63,588 tons, pulpwood by 40,338 tons and rye (all upbound) by 29,003 tons.

Total freight through the St. Lawrence canals during July was the heaviest for this month since 1928 and amounted to 977,261 tons, exceeding the traffic for July, 1933 by 138,018 tons. Pulpwood was heavier than in July last year by 65,304 tons, bituminous coal increased by 23,613 tons, iron ore by 23,403 tons, sand by 17,715 tons, barley by 15,126 tons and gasoline by 12,208 tons.

The total tonnage through the St. Lawrence canals for the season to July 31, amounted to 2,911,160 tons, as compared with 3,021,310 tons for the corresponding period in 1933.

Heavy Ore Shipments

Ore shipments from upper lake ports during the month of July showed an increase of nearly 30 per cent over the amount shipped in July, 1933. A total of 4,432,140 tons of ore were shipped from upper lake ports during July of this year as compared with 3,429,683 tons in the month of July, 1933. The total shipment of ore for the season up to Aug. 1, 1934 was 11,523,525 tons as compared with 5,694,696 tons for the season of 1933 up to Aug. 1.

Increase in ore shipments during July of this year over the same month last year amounted to 1,002,457 tons, or 29.93 per cent. The increase in ore shipments for the season up to Aug. 1 this year over the same period in 1933 amounted to 5,828,829 tons or 102.35 per cent.

Shipments of ore by rail from Lake Erie ports to furnaces during the month of July amounted to 2,225,006 tons, making a total for the season up to Aug. 1 of 6,332,537 tons as compared with a total shipment of 3,257,686 tons for the same period in 1933. On Aug. 1, 1934 the balance of ore on dock at Lake Erie ports was 4,499,858 tons as compared with 4,792,192 tons on Aug. 1, 1933.

July Lake Levels

The United States Lake survey reports the following monthly mean stages of the Great Lakes for the month of July, 1934, determined from daily readings of staff gages:

Lakes	Feet above mean sea level
Superior	602.82
Michigan-Huron	578.06
St. Clair	573.66
Erie	570.38
Ontario	244.13

Lake Superior was 0.09-foot higher than in June and it was 0.04-foot above the July stage of a year ago.

Lakes Michigan-Huron were 0.09-foot higher than in June and they were 0.67-foot below the July stage of a year ago, 1.61 feet below the average stage of July of the last ten years.

Lake Erie was 0.01-foot lower than in June and it was 1.39 feet below the July stage of a year ago, 1.86 feet below the average stage of July of the last ten years.

Lake Ontario was 0.23-foot lower than in June and it was 1.04 feet below the July stage of a year ago, 2.09 feet below the average stage of July of the last ten years.

Propeller Club Meeting

The annual meeting of the Propeller club of the port of Cleveland, was held on July 26 at the Sleepy Hollow Country club. The second of three golf tournaments scheduled during the summer preceded the meeting.

This was the second annual meeting of the Propeller club, of the port of Cleveland, and seven men were elected to the board of governors, five for the three-year term, one for the two-year term and one for the one-year term. The full board of governors, 16 in all, as now constituted is as follows:

For the three year term: C. R. Kells, W. C. Dressler, E. L. Jefferson, B. R. Tewksbury, and A. J. Ferbert.

For the two year term: A. B. Kern, G. C. Hutchinson, F. S. Hutchinson, A. T. Wood, G. A. Myers and J H. Lawrence.

For the one year term: R W. England, L. C. Hinslea, H. N. Herriman, L. J. Wallace and H. L. Gobeille.

All of the men elected to the three year term had been members of the old board so also had J. H. Lawrence who was elected to a two year term. H. L. Gobeille, elected to the one year term, had not previously served as governor.

At the meeting of the board of governors on July 31, the following officers were elected for a term of one year: L. C. Hinslea, president; W. C. Dressler, vice president; E. L. Jefferson, treasurer; and G. A. Myers, secretary.

The third golf tournament and dinner will be held at the Acacia Country club, on Aug. 30.

Canadian Grain Shipments

From July 15 to Aug. 14, inclusive, shipments of grain from Fort William and Port Arthur, Ont., via lake vessels were as follows: Wheat to Canadian lower lake ports, 11,568,451 bushels; to Montreal, 1,601,068 bushels; to other Canadian ports, 136,386 bushels; to Buffalo, 3,768,088 bushels and to other United States ports, 223,871 bushels. This makes a total of 17,297,864 bushels of wheat shipped via lake vessels from Fort William and Port Arthur from July 15 to and including Aug. 14.

During the same period, oats moved from Fort William and Port Arthur in the following quantities: to Canadian lower lake ports, 945,983 bushels; and to Montreal 103,177 bushels, or a total of 1,049,160 bushels. The movement of barley was as follows: To Canadian lower lake ports, 1,214,839 bushels; to Montreal, 245,191 bushels; none to Buffalo; and 110,000 bushels to other United States ports. This makes a total of movement of barley of 1,570,030 bushels.

Only a comparatively small quantity of rye was shipped, as follows:

(*Continued on Page* 38)

Lake Vessels in Service Reduced in Number

Decline in the number of bulk vessels operating on the Great Lakes continues, though the reduction since July 15 is not large. In some quarters it is felt that the demand in September and October will call for additional tonnage. In the meantime, however, there has been a marked reduction in the number of vessels in operation since the peak, on June 15.

Figures compiled by C. C. Lindeman of the M. A. Hanna Co., Cleveland, show that on Aug. 15 American lake bulk vessels in commission numbered 180 with a total trip capacity of 1,628,000 tons, giving a percentage of 54.88 in number and 59.23 in carrying capacity of the total fleet available. This may be compared with the standing on July 15, when 190 vessels (57.92 per cent) of 1,696,000 tons capacity (61.7 per cent) were in commission. The standing on June 15 was still more favorable when 205 vessels (62.5 per cent) of 1,835,000 tons capacity (66.76 per cent) were in commission.

What is of even greater significance, this is the first time the number and tonnage of vessels have fallen below the figures for the corresponding date last year. On Aug. 15, 1933, no less than 217 (65.76 per cent) of 1,895,100 tons capacity (68.59 per cent), were in commission.

Of the 180 vessels in commission on Aug. 15, 134 were engaged in the ore trade and 46 in other bulk trades. On July 15, of the 190 vessels in commission 149 were engaged in the ore trade. A year ago on Aug. 15, of the 217 vessels in commission, 185 were engaged in the ore trade.

Nine companies were operating 100 per cent of their available tonnage on Aug. 15. Among these companies were: Cleveland Cliffs Iron Co., with 21 vessels; M. A. Hanna Co., with 10 vessels; Inland Steamship Co., Hutchinson & Co., managers, with 3 vessels; Reiss Steamship Co., with 9 vessels; Valley Camp Steamship Co., with 8 vessels; and several smaller companies with from 2 to 4 vessels each.

The Pittsburgh Steamship Co. with a total fleet of 86 vessels continued 43 in operation, all engaged in the ore trade. The Interlake Steamship Co., with a fleet of 49 vessels had 22 in commission, 11 in the ore trade. Hutchinson & Co., with a fleet of 19 vessels, had 6 in commission, 3 in the ore trade. Bethlehem Transportation Corp., with a total fleet of 16 vessels had 10 in commission, all in the ore trade. Great Lakes Steamship Co., with 19 vessels had 4 in service, all in the ore trade. Boland & Cornelius, with 12 vessels had 6 in commission, one of which was in the ore trade. The Columbia Steamship Co., with 10 vessels, had 4 in service, all in the ore trade. The Shenango Steamship Co., with 3 vessels had 2 engaged, both in the ore trade. The Midland Steamship Co., had 4 in service, all in the ore trade. The Interstate Steamship Co., had 3 of its 4 vessels engaged in the ore trade.

The Wilson Transit Co. with a total fleet of 11 vessels had 9 in service, none of which were in the ore trade. H. & G. M. Steinbrenner had two of its 5 vessels in service, neither of which was engaged in the ore trade.

Heads Two Companies

J. Burton Ayers, well known Great Lakes shipping man, has been elected general manager of the Great Lakes Steamship Co., Cleveland, and president and assistant treasurer of the Toledo Shipbuilding Co., Toledo, O., succeeding H. S. Wilkinson in both positions. Announcement of Mr. Ayres' promotion was made in Cleveland on Aug. 11 by Horace S. Wilkinson, president of the Great

J. Burton Ayers

Lakes Steamship Co., and chairman of the board of the Toledo Shipbuilding Co.

Mr. Ayers has been connected with shipping on the Great Lakes for 34 years, beginning his career with the United States Transportation Co., then managed by Capt. William W. Brown and H. S. Wilkinson. In the year 1900 when he joined the company five steamers were built and in the following year six additional vessels. In 1910 the company had a total of 21 ships in the iron ore, coal and grain trades. It was then and

(*Continued on Page* 38)

Coal Movement Continues Ahead of Last Year

Bituminous coal shipments, via lake vessels from Lake Erie ports, from the beginning of the season up to 7 a.m. Aug. 13, amounted to 19,115,463 net tons of cargo and 607,126 net tons of bunker, giving a total of 19,722,589 net tons. This is an increase of nearly three and three quarter million tons over the same period last year and it is not far from double the movement in the same period of 1932. It is also about three and a half million tons more than the movement in the same period of 1931. The figures used are compiled by the Ore & Coal Exchange, Cleveland.

Specific figures for the bituminous coal movement in previous years are as follows: In the same period during 1933, cargo coal moved amounted to 15,605,985 tons and the bunker coal, 443,129 tons, making a total of 16,049,114 net tons. For the same period in 1932, cargo, bunkers and total bituminous coal shipments were respectively; 10,206,059 tons, 252,410 tons, and 10,458,469 net tons. For the same period in the year 1931, the figures for bituminous coal shipments in cargo, bunkers and total, were respectively; 15,712,509 tons, 516,805 tons and 16,229,214 net tons.

Average shipments of bituminous coal each week for the four weeks ending 7 a.m., Aug. 13, amounted to 1,167,543 net tons of cargo and 39,874 tons of bunkers. This is a decrease from the average weekly shipments for the four preceding weeks of 47,932 tons of cargo.

Anthracite coal shipments on the lakes for the season up to Aug. 1 amounted to 390,039 long tons, while for the same period in 1933 the amount was 171,392 long tons.

Schools to Open Again

The Lake Carriers' associations has announced that it will, during the coming winter, conduct free schools in navigation and marine engineering. These schools will be located at Cleveland, with a class in marine engineering at Marine City, Mich.

Application forms for enrollment will be sent to the ships in September. Classes are to begin on Thursday, Jan. 3, 1935.

To be accepted as students, the welfare plan committee will require that applicants fully meet the rules and regulations of the United States Steamboat Inspection service for eligibility to licensed grades in American lake vessels.

Capt. John C. Murray, assisted by Capt. C. A. Martin, will be in charge of the Cleveland class in navigation. David Gaehr will conduct the Cleveland class in marine engineering and Ralph Britz will continue as instructor of the Marine City class.

Honor Ship Officers of Two Steamship Lines

When the liner LEVIATHAN was at Havre on July 29, Commodore A. B. Randall, her captain, was presented the decoration of the Legion of Honor by the French government. This honor was conferred in recognition of his war services as commodore of convoys in command of merchant fleets between the United States and Europe. The presentation was made by Leon Meyer, deputy mayor of Havre, at a luncheon attended by civic and shipping officials, naval and merchant marine officers, and consular representatives. Commodore Randall is well known for his many rescues.

Tribute was paid to Commodore Randall's distinguished sea career, splendid war record and to the heroic sea rescues under his direction and in which the lives of French citizens were saved.

Capt Thomas F. Gates

On July 29 Capt. Thomas F. Gates of the Atlantic Transport Line, veteran North Atlantic shipmaster, retired from the sea after more than half a century of active service. He has been in command of the MINNETONKA since that liner came out in 1924.

The retirement of Captain Gates brings to a close a notable sea career, both in point of time and service, for he is senior commander in the North Atlantic trade. He has been continuously in command of vessels for 45 years and has been at sea for 56 years during which he achieved a splendid record for fine seamanship. He celebrated his seventy-second birthday on Jan. 5 last, but looks not a day over fifty.

Los Angeles Commerce Shows Decline

Preliminary figures on water commerce through the port of Los Angeles, indicate that the month of July was not quite up to June in both import and export trade. Strike conditions have made it difficult to compile figures promptly and final details may increase the preliminary estimate.

Exports during July were $6,427,000, compared with $5,173,823 in July of last year, and imports were $5,361,000, compared with $2,920,431 in July, 1933. Both of these figures are considerably below those for June. A number of large cargoes went out during July, returns on which have not yet been made.

Shipments to Hawaii were more than double the ordinary shipments.

Launch Twin Screw, Diesel, River Towboat

THE new twin screw tunnel stern, diesel driven towboat PEACE, building for the Union Barge line, Pittsburgh, was launched at noon Aug. 14, at the Neville Island yard of The Dravo Contracting Co., Pittsburgh. The sponsor was Miss Emma Coulter.

Principal particulars of the new vessel are noted in the accompanying table. The hull is of steel with a ship-shaped bow, and a tunnel stern for twin propellers. There are four fuel oil tanks fitted in the wings. The twin 65-inch bronze four-bladed propellers, furnished by Cramp Brass & Iron Foundries Co., are of the solid type and the shafts run in roller bearings mounted in contra flow type struts. Two main rudders are located aft and four backing rudders are located forward of the propellers. The forward and after rudders are independently controlled by electric hydraulic steering gear with full follow-up control in the pilot house.

Propelling power is supplied by two 6-cylinder, Winton, solid injection, direct reversible, diesel engines, each developing 375 horsepower at 240 revolutions per minute. Included in the auxiliary machinery are two 50-kilowatt Winton diesel generator sets; and two 2-stage motor driven air compressors.

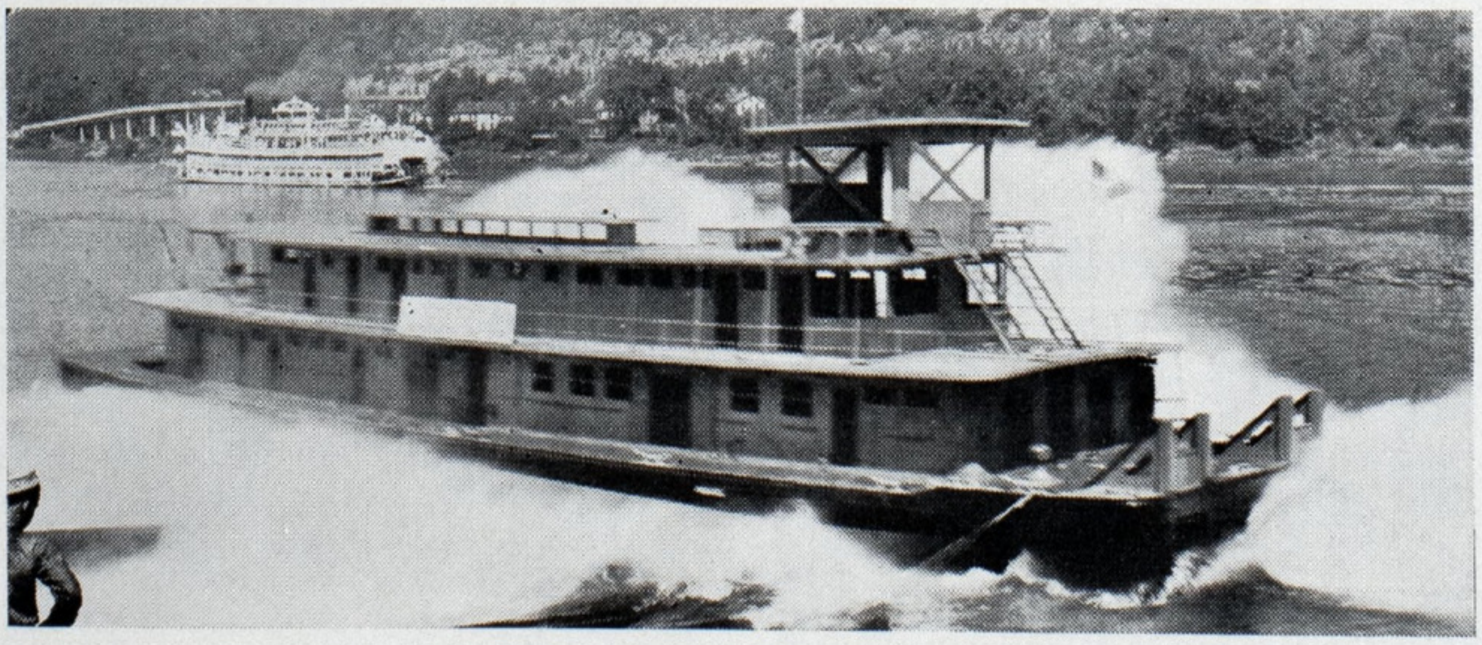
Pumps for various services were supplied by De Laval Steam Turbine Co., as follows: three motor driven, for water circulating; one for fuel oil transfer; and one for the steering gear. There are also water filters, lubricating and fuel oil centrifuges, and a drinking water still. Four electric capstans, built by The Dravo Contracting Co., are provided: two at the forward end and two amidships; one hand power capstan is located on the aft end.

The superstructure consists of two deck houses surmounted by a pilot house, all made entirely of steel. In way of the living quarters the steel work is sheathed with Insulite. The living spaces have been arranged to provide commodious and cool quarters for the crew when operating in southern waters. A large and exceptionally well equipped galley is fitted with oil burning range, double monel metal sink, serving table and cupboards. There are two large refrigerators, supplied by Carrier Mfg. Co., for carrying perishable foods, and ample space for dry stores. To further add to the comfort of the crew and make the boat self-contained, complete laundry facilities, consisting of washing machines, mangles, etc., have been installed on the main deck. The quarters are all fitted with copper radiators using low pressure steam for heating supplied by an oil burning boiler in the engine room.

Classification of the PEACE is *A-1 for river service in the American Bureau of Shipping. PEACE was the name of the pioneer tunnel stern river towboat built by the late Francis R. Dravo during the time of the World war. The new vessel will be the fourth in the fleet of the Union Barge line operating between Pittsburgh and Memphis, Tenn.

Principal Characteristics

Name	Peace
Type	Twin screw, Diesel, River Towboat
Builder	The Dravo Contracting Co.
Owner	Union Barge Line Corp.
Launched	Aug. 14, 1934
Length overall, feet, inches	161 0
Length between p.p., feet, inches	160 0
Breadth Molded, feet, inches	34 0
Depth molded, feet, inches	7 9
Draft, feet, inches	5 6
Displacement, fresh water, tons	560
Gross tonnage	635
Net tonnage	560
Propelling machinery, in twin screws, two Winton 6-cylinder, solid injection, direct reversible diesel engines, each of 375 b.h.p. @ 250 r.p.m.	
Boiler	One vertical, 40 h.p. for heating
Speed, statute miles per hour	10.5
Classification	American Bureau of Shipping



Steel hull, twin screw, diesel, river towboat Peace, launched Aug. 14 at the Neville Island Yard, Dravo Contracting Co., Pittsburgh

Personal Sketches of Marine Men

John McKenzie, Commissioner of Docks, New York City

By Ben K. Price

HIS appointment as commissioner of docks of the greatest port in the world was received with universal approval by all classes of shipping men.

SERVING for nearly three decades in the department he now heads he has acquired an intimate detailed knowledge of the city's waterfront conditions.

PLANS for improvement of facilities are based on a broad view of the port's future needs to assure sound growth and development.

UN JOHN McKENZIE as commissioner of docks, New York city has a man whose qualifications for the heavy responsibilities of his job have withstood virtually every known acid test. Rising from the ranks, after 28 years in the civil service, to break a political precedent of long standing in his appointment to the commissionership, to come through with flying colors in a searching political investigation into the general city administration of a party then in power and to be continued in office by the party which later gained the ascendency and was sponsored by the investigating faction, he has a record which, in many respects, is unique in the annals of New York civic government. His special fitness for the position is unchallenged.

Put it in another way, here is a man, who, as chief clerk in the docks department, was interrupted in the midst of an explanation of technical pier matters before the sinking fund commission—interrupted by James J. Walker, then mayor of New York, to be told he was thereby appointed commissioner.

The manner of the announcement was unusual, but even more unusual, to those who followed city affairs in New York, was the fact that he, a non-resident of Manhattan, should have the job. Precedent in the democratic organization of this city had decreed that all commissionerships should go to the district leaders in Manhattan. As a matter of fact, Mr. McKenzie, it was said, did not even know the Democratic leader in his own borough.

Then, a little later, came the Seabury investigation, which made headlines from one end of the country to the other, but Mr. McKenzie was never brought forward for public examination, except as expert witness on the affairs of his own particular department. Then came the closing days of last year and the commissioner was summoned to the offices of Mayor-elect Fiorello H. LaGuardia. A little later the mayor-elect came out of the conference and this is what he said:

"There will be a complete reorganization of the dock department but Commissioner McKenzie will remain as its head. I have found his services, while I was president of the board of aldermen, very satisfactory. He came up from the ranks, and also through all of the exposure of terrible conditions in the dock department without a shadow of a blemish on his record."

The acclaim that immediately went up bespoke his high standing with shipping men. Universal approval was voiced by all fair minded citizens familiar with his record. The reappointment was recognized at once as in every respect in the best interests of the port and of its great shipping.

Commissioner McKenzie was born in Manhattan, 51 years ago. He became affiliated with the dock department at the age of 23 and studied law after hours, graduating from the Brooklyn Law school of St. Lawrence university. This legal training was to prove invaluable to him, but it was his grasp of detail that was to serve as the cornerstone of his career, and in the years that followed he became known to his associates as a veritable human encyclopedia on New York waterfront conditions.

Since taking office he has conducted a constant, but conservative program of rehabilitation and expansion of facilities, leading only within the past month to the letting of contracts for three 1100-foot piers, to meet the needs of super-liners now in the course of construction on the other side.

Other major improvements in prospect await only more definite signs of a normal resumption of world trade, but meanwhile plans go on for consolidating the port's pre-eminent position under existing conditions. One phase at the moment is a careful study of the question of rentals, with the possibility of a new policy evolving which should enhance the port's position in its competition with other eastern ports.

The commissioner resides in Flushing, Long Island, and between home and office, his friends declare, few outside interests creep in.

Communications

(*Continued from Page 20*)

committee, upon which the United States is represented, in London. This committee considers the various recommendations received and recommends changes in the basic (British) edition of the code upon which the various national editions are based.

Use of Radio in War

As yet, no mention has been made of the utilization of radio communications by the merchant marine during war, or during the period immediately preceding the outbreak of war. Our merchant marine is of vital importance during war, and every effort must be made to prevent the sinking or capture of a single vessel. It is normal, just prior to the declaration of war, for a nation to find its merchant ships scattered all over the world, unprepared for the emergency. The government must attempt to effect the safe return of all ships, and here is where radio can be of great benefit.

War warnings can be sent to the ships via commercial radio stations, naval radio stations, cable, or consular officials. The best routes to the United States for any particular merchant ship may be indicated. During this period of anxiety the merchant ships may be required to communicate with their home ports or other ships. Obviously, at this time a master feels his responsibility. With a good general knowledge of communications, his task is made easier—his knowledge prevents him from placing himself in a helpless position with regard to advice from his radio operators; he can be more certain of the proper action demanded by the situation.

During war, ships of the merchant service may operate with the navy or be convoyed by naval escorts. Such operation requires a solid background of communications to avoid disaster. A short radio message sent at the wrong moment may involve the loss of an entire convoy with a consequent blow to the fortunes of the nation in the war. The proper utilization of radio facilities may mean the difference between victory and defeat. It is noted that a number of progressive officers of our merchant marine have already mastered the problems of radio communication, realizing the benefits accruing to them by such a course.

Visual Communications

Some specific mention should be made of visual communications, so important during time of war, when communication at sea is particularly necessary, and when the use of radio is sometimes dangerous. Contact and co-operation between our navy and merchant marine would naturally become much closer in time of emergency, and it is therefore important that each of the two services understand the problems of the other.

It is evident that the ability to carry on visual communications between naval and merchant vessels. when operating together in time of emergency will be greatly enhanced by training and experience in time of peace. Numerous merchant shipowners and operators have expressed the desire to co-operate with the navy department in this matter of peacetime training, and have been so doing for some time, with the result that visual communication between naval and merchant vessels has shown marked improvement in quality as well as quantity.

United States naval vessels have instructions to exchange calls and communicate by visual means with ships of the American merchant marine whenever practicable. Navy ships are encouraged to employ the international code of signals in this connection. Monthly reports are submitted by naval vessels listing all such successful communications, and these reports are summarized and issued quarterly by the navy department, addressed to all merchant shipowners and operators who have expressed the desire to cooperate with the navy in this matter, as well as to all naval vessels.

Future of Sea Communication

There should be no doubt in the mind of anyone concerning the importance of radio communication to our merchant marine, whether it serves to promote safety of life at sea, as an aid to navigation, or in a business or social capacity. It is also inevitable that in the years to come it will play a still greater part, particularly as technical advances are made and new applications of radio appear. The officers of our merchant marine will be thrown into continuous contact with radio, and will realize, even more than they do today, how essential it is to their occupation.

With such a bright future of radio on the sea, it appears only natural that merchant marine officers should better fit themselves for their work by a comprehensive study of the broad principles of communications. As noted above, progressive officers are already doing this. Suggestions have been advanced that the examination for licenses for masters and other officers should include a number of questions on communications, based on a broad knowledge of the subject.

Obviously the place to teach such a subject in the case of future officers is in the nautical schools. Some attempt has been made in this direction, but as yet the idea has not yet been generally accepted.

Far-sighted merchant officers will readily perceive the value of knowledge of communications. As masters of ships they cannot be expected to attend to all the details of radio communications, even though they alone are responsible for the proper conduct of such communications. It therefore appears perfectly natural that masters of large passenger vessels should entrust these duties to one of their subordinate deck officers, who should be expected to supervise actively the ship's radio communication and navigational devices, as well as visual communication facilities, under the direction of the master. This officer, because of his all-around qualifications, will be in an excellent position to advise the master on important points concerning the safety of the vessel insofar as communication matters are concerned. The designation of communication officer could be in addition to his regular duties, and might be rotated over a number of years among the various officers of the vessel in order to provide each officer with suitable experience in this newest branch of the seaman's profession.

This suggestion to designate a communication officer on merchant ships is advanced not only because of the anticipated value such a course will afford to the nation, but for the benefit of the merchant officers themselves. They will have a tremendous advantage over others who are content to relegate the supervision of an important adjunct of their ships to others who are not fully qualified.

During the past 150 years the traditions of the American merchant marine have been second to none. From the days of sailing vessels the qualifications of its officers have been unquestioned throughout the world. Now that modern progress moves swiftly, and is accepted casually, let us not be lulled into a false sense of superiority and thereby neglect to initiate the steps necessary to keep abreast of progress and ahead of other nations.

Piers Operating Co.

Piers Operating Co., Boston, of which Morrill Wiggin is president and Sherman L. Whipple Jr., is treasurer, was recently awarded a five-year lease of the Army base terminal at South Boston at a yearly rental of $65,711.

Word has been received from this company that the Wiggin Terminals Inc. has no financial interest in Piers Operating Co., which has been financed by Morrill Wiggin, Sherman L. Whipple Jr., and their friends. Morrill Wiggin, for many years associated with Wiggin Terminals Inc., has resigned his position with this company to assume the presidency of Piers Operating Co.

Canadian Grain Shipments

(*Continued from Page* 32)

to Canadian lower lake ports, 27,015 bushels; none to Buffalo; and to other United States ports, 113,800 bushels, making a total movement of 140,815 bushels. During the same period, screenings moved to Buffalo in one cargo of 820 tons and to other United States ports in two cargoes totaling 2207 tons, making a grand total for screenings during this period of 3027 tons.

The grand total in all kinds of grain shipped via lake vessels from Fort William and Port Arthur, during the period from July 15 to Aug. 14 both inclusive, was 20,057,869 bushels, and 3027 tons of screenings.

Tugmen's Strike Ends

After 62 days on strike, licensed tugmen, firemen, and linesmen returned to work on Aug. 1. This action, not only again made possible the use of tug service for lake shipping but it also meant that contracts for harbor improvement could go ahead. It is understood that action favorable to the termination of the strike was finally decided upon by the men at Cleveland, Chicago and Buffalo after orders had been received from Owen J. Kavenagh of Buffalo, grand president of the Tug Firemen & Linemen's Protective association, for the men to return to work.

The dredge tugmen also have gone back to work and negotiations are now under way for a new working agreement between the two unions and the Great Lakes Towing Co., headed by George A. Tomlinson and the River's and Harbors Improvement association of Chicago of which John F. Cushing is president.

Ashtabula Harbor

The Dunbar-Sullivan Co., Detroit, successful bidders on the contract for the improvement of the harbor at Ashtabula, O., which involves a total expenditure of $400,000, started work during the last half of August. Included in the work is the removal of a part of the old breakwater near the mouth of the harbor, extension of the west breakwater and altering the position of the east breakwater.

When completed these improvements will greatly facilitate the operation of the larger bulk carriers in this harbor.

John P. Magill Dies

John P. Magill, who for the last two years has been manager of the maritime association of the port of New York, died suddenly on July 29 at his summer home at Vinalhaven, Me. He was 67 years old.

About five years ago Mr. Magill became special representative of the association and was elected to the office of manager two years ago.

He was chairman of the North Atlantic ports conference and also served as chairman of the steamship committee of the maritime exchange.

Naval Bids Received

(*Continued from Page* 15)

Wallace	5,200,000	4,510,000	27
	4,830,000	4,200,000	27 – 30
N. Y. Ship	5,780,000	4,900,000	27
	5,300,000	4,500,000	27 – 30
Beth. (Fore River)	6,150,000	4,920,000	27
	5,580,000	4,662,000	27 – 30
Beth. (Union)	6,650,000	5,320,000	27
	6,050,000	4,840,000	27 – 30

Class II**

General	3,558,000	3,458,000	27
	3,310,000	3,210,000	27 – 30
Los Angeles	3,563,000	3,463,000	27
	3,315,000	3,215,000	27 – 30
Wallace	5,030,000	4,375,000	27
	4,700,000	4,080,000	27 – 30
N. Y. Ship	5,280,000	4,400,000	27
	4,800,000	4,000,000	27 – 30

Class II-A

Bath	5,081,000	4,416,000	27
	None	None	..
Beth. (Fore River)	5,260,000	4,210,000	27
	4,880,000	3,820,000	27 – 30
Beth. (Union)	5,700,000	4,560,000	27
	5,280,000	4,130,000	27 – 30
United	None	4,134,000	28
	None	3,726,000	28 – 30

Class II-B

Federal	4,625,000	4,205,000	24
	4,092,000	3,720,000	24 – 27
Beth. (Fore River)	5,030,000	4,265,000	27
	4,840,000	3,870,000	27 – 30
Bath	5,038,000	4,373,000	..
	None	None	..
Beth. (Union)	5,760,000	4,620,000	27
	5,230,000	4,190,000	27 – 30
United	None	4,087,000	28
	None	3,679,000	28 – 30

Class II-C

Bath	4,005,000	4,330,000	..
	None	None	..
Federal	4,710,000	4,282,000	27
	4,169,000	3,790,000	27 – 30
Beth. (Fore River)	5,220,000	4,170,000	27
	4,738,000	3,784,000	27 – 30
Beth. (Union)	5,650,000	4,510,000	27
	5,120,000	4,100,000	27 – 30
United	None	4,066,000	28
	None	3,658,000	28 – 30

Class II-D

Federal	4,727,000	4,298,000	26
	4,183,000	3,803,000	26 – 29

Class II-E

Federal	4,799,000	4,363,000	27
	4,249,000	3,863,000	27 – 30

Class II-F

Federal	4,781,000	4,346,000	27
	4,228,000	3,844,000	27 – 30

Three Submarines—Nos. 177, 179, 181

About 1300 tons

Class I**

Shipyard	Proposal*	Alternate*	Time (Months)
Electric Boat	$3,657,000	$3,047,000	27
	3,100,000	2,587,000	27 – 30
	2,867,000	2,387,000	27-30-33
Sun Ship	3,824,000	3,414,500	27
	3,488,000	3,114,500	27 – 30
	None	None	..

Class II**

Electric Boat	3,723,000	3,107,000	27
	3,107,000	2,597,000	27 – 30
	2,857,000	2,377,000	27-30-33

Class II-B

Electric Boat	3,753,000	3,137,000	27
	3,137,000	2,627,000	27 – 30
	2,887,000	2,407,000	27-30-33

Heads Two Companies

(*Continued from Page* 33)

is now one of the larger and more important lines in these trades on the Great Lakes. At the present time the company is the sixth largest in the carrying capacity of its fleet.

On consolidation, the company's name was changed to Great Lakes Steamship Co. Having served with the company since its organization and the building of the first vessel, his elevation to the general managership is a recognition on the part of the stockholders of his faithful and able conduct of the company's business. As general manager Mr. Ayers is in complete charge of the operation of the company's fleet of vessels.

Mr. Ayers has been, for some time, in virtual charge of the operations of the Toledo Shipbuilding Co., which is affiliated in interests with the Great Lakes Steamship Co. His election as president is, therefore, a deserved recognition of his services to this company during a particularly difficult time.

Largest Welded Ship

(*Continued from Page* 18)

of 75 gallons capacity supplied by S. F. Bowser & Co.

Electrical equipment, both motors and generators, was supplied by the Diehl Mfg. Co. The steering gear, of double ram, link type, electric hydraulic, operated by a 120-volt electric motor and hydraulic pump, was supplied by the American Engineering Co. The windlass with electric motor drive was also furnished by the same company.

All of the pumps for the various services were supplied by the Northern Pump Co. They are listed as follows: For circulating water and fire purposes, two bronze lined rotary pumps, capacity 185 gallons per minute; for fuel oil transfer, one rotary brass pump direct connected to a direct current motor; for bilge suctions, three rotary pumps, 26 gallons per minute at 45-foot head; for lubricating oil, one rotary pump driven by direct connected electric motor; for cargo, two pumps fitted to handle gasoline, capacity 1000 fifty-gallon barrels per hour, driven by 120-volt variable speed electric motors.

The largest tow to traverse the Illinois waterway of the Great Lakes to Gulf route docked at Chicago recently when the towboat WILLIAM T. WARNER arrived with four 135-foot barges and one 300-foot barge. Cargo brought from New Orleans included ammonia tanks, sugar, beer, nails, leather goods, cotton, and other commodities, while about 1500 tons of wheat was moved from Kansas, Nebraska, and Iowa.

Channel Ferries

(*Continued from Page* 14)

easily carried out. A feature of the pressure parts is the entire absence of bolted handhole doors.

Each boiler is designed to give 16,000 pounds of steam per hour, superheated to about 500 degrees Fahr. From feed water at 270 degrees Fahr. The working pressure is 250 pounds per square inch. Under these conditions the temperature of the air to the stokers will be from 350 degrees to 400 degrees Fahr.

The airheaters are of the latest Yarrow horizontal type in which the air passes through the tubes while the gases pass across them. This new design of airheater occupies small space and is of light weight.

Automatic Underfeed Stokers

In a coal producing country like Great Britain, it is a matter of national importance to use coal as fuel wherever it can be done without sacrificing efficiency. Since the propelling machinery of these vessels must of necessity be placed below the train deck, the use of coal as fuel is particularly advantageous as it is possible to run a train load of coal cars immediately over the bunkers and to tip the coal directly into the bunkers.

However, it was only after careful examination of the advantages of various schemes of propulsion that it was decided to use coal as fuel. It was found that it would be possible to obtain the fullest advantage of coal as fuel by using watertube boilers and automatic mechanical stokers with self trimming bunkers leading directly into hoppers of the stokers. In this way the coal "flows" to its work, not being touched by hand in any way. The only manual labor required is the removal of ashes from the special ashpits at the end of the fire grates.

Yarrow watertube boilers fitted with Taylor underfeed stokers were selected. In order to test thoroughly and to demonstrate the efficiency of this particular combination, one of the boilers was subjected to an exhaustive series of trials at varying loads and with different kinds of coal. Because of the proximity of Dover to the Kent coal fields, experiments were made to determine the best type of Kent coal for use on the train ferry.

Conditions of service were reproduced at the trials, the boiler working under forced draft in a closed stokehold. A Yarrow-Terry turbine type of fan of standard design, as fitted in many vessels, was used. The tests were highly successful. Combustion was very good and the furnace conditions showed that the coal burned out completely before it reached the ash pit at the end of the stoker. Perfect combustion, it was found, depends on the regulation of the speed of the fan.

The stokers, as shown in the accompanying illustration, are of the retort type which have already been introduced successfully by Yarrow & Co. in several important merchant vessels. They are supplied by the Taylor Stoker Co. Ltd., and in this particular case have been designed to meet the special conditions of service and to burn a wide variety of coals.

As previously mentioned the bunkers are arranged so that the coal feeds by gravity to the stoker hoppers. From the stoker hopper the coal is thrust by each fuel feeding ram into one of four retorts which are buried in the fuel bed below the zone of combustion, or, in other words below the level of air admission. The coal is stored in these four retorts until such time as it is required by the fire above.

Order of Ignition

No combustion can take place in the retorts because the fuel has been pressed into them with sufficient force to exclude all air pockets, but insofar as the coal in the retorts is able to "feel" the heat of the fire above, there is a continuous and gradual rise of volatile matter from the whole length of each retort, which continues upwards until a level is reached where air admission takes place. When, therefore, the fuel which is stored in the retorts is required for combustion it is gradually raised by the stoker mechanism to the level of air admission by which time it has been completely devolatilized and issues from the top of the retort in the form of porous coke. This process is a continuous one, fresh coal being fed into the bottom to take the place of the coke issuing from the top of each retort.

The coke issuing from any one retort meets the coke issuing from adjacent retorts across the intervening air admission zones, and thus the fire bed structure extends in one continuous coke mass across the entire width of the stoker. When the volatile matter reaches the air admission level, it is picked up by the preheated air draft, from forced draft fans, which is being forced upwards through the fire bed. The preheated air and gases then "churn" their way together upwards through the maze of interlacing passages formed by the coke bed. Accordingly, on reaching the incandescent surface of the fire bed, the carbonaceous gases are so thoroughly oxygenated that combustion proceeds with extreme rapidity and shortness of flame.

It is, therefore, axiomatic that the greater the compactness of the coke in the fire bed, the greater is this scrubbing or churning action, the more thorough is the oxygenation of the gases, the shorter is the flame from the fuel bed and the more intense is the radiant temperature effect of the fuel bed surface. It is apparent that one very important element in design of the stoker is to keep the fuel bed moving without destroying the homogeneity of the coke mass above the air admission zone. This is achieved by moving the fuel bed as a whole by the system of reciprocating pushers which operate in the bottoms of the retorts, and which are designed to do their work without disrupting the crust of the fire.

Without Grit or Smoke

The importance of the above, in marine design, is at least two-fold. In the first instance, homogeneity of the coke structure above the air admission zone is a definite asset in marine stokeholds where headroom is limited, because short flaming combustion is the primary essential of efficient steam generation where combustion chamber volume is restricted. In the second place, the tightly packed and homogeneous fuel bed structure is the prime essential of gritless and smokeless funnel emission.

Westinghouse Business Up

Westinghouse Electric & Mfg. Co.'s report for the second quarter of 1934 shows a total of $33,655,022 for orders received, as compared with $20,237,588 for the previous quarter and $17,557,964 for the second quarter in 1933.

Sales billed for the second quarter of 1934 totaled $27,287,545 as compared to $17,994,045 for the previous quarter and $15,926,335 for the corresponding quarter in 1933.

A net profit of $1,744,427 is shown for the second quarter, as compared to a net loss of $1,776,152 for the previous quarter and a net loss of $2,078,424 for the corresponding quarter in 1933.

Total operations for the first six months of 1934 show a net loss of $31,725 as compared to a net loss of $5,569,996 for the same period in 1933.

According to F. A. Merrick, president of Westinghouse Electric & Mfg. Co., orders received during the quarter ended June 30 show an increase of 92 per cent over the same quarter in 1933. Orders received during the six months ended June 30 show an increase of 77 per cent over the corresponding six months of 1933.

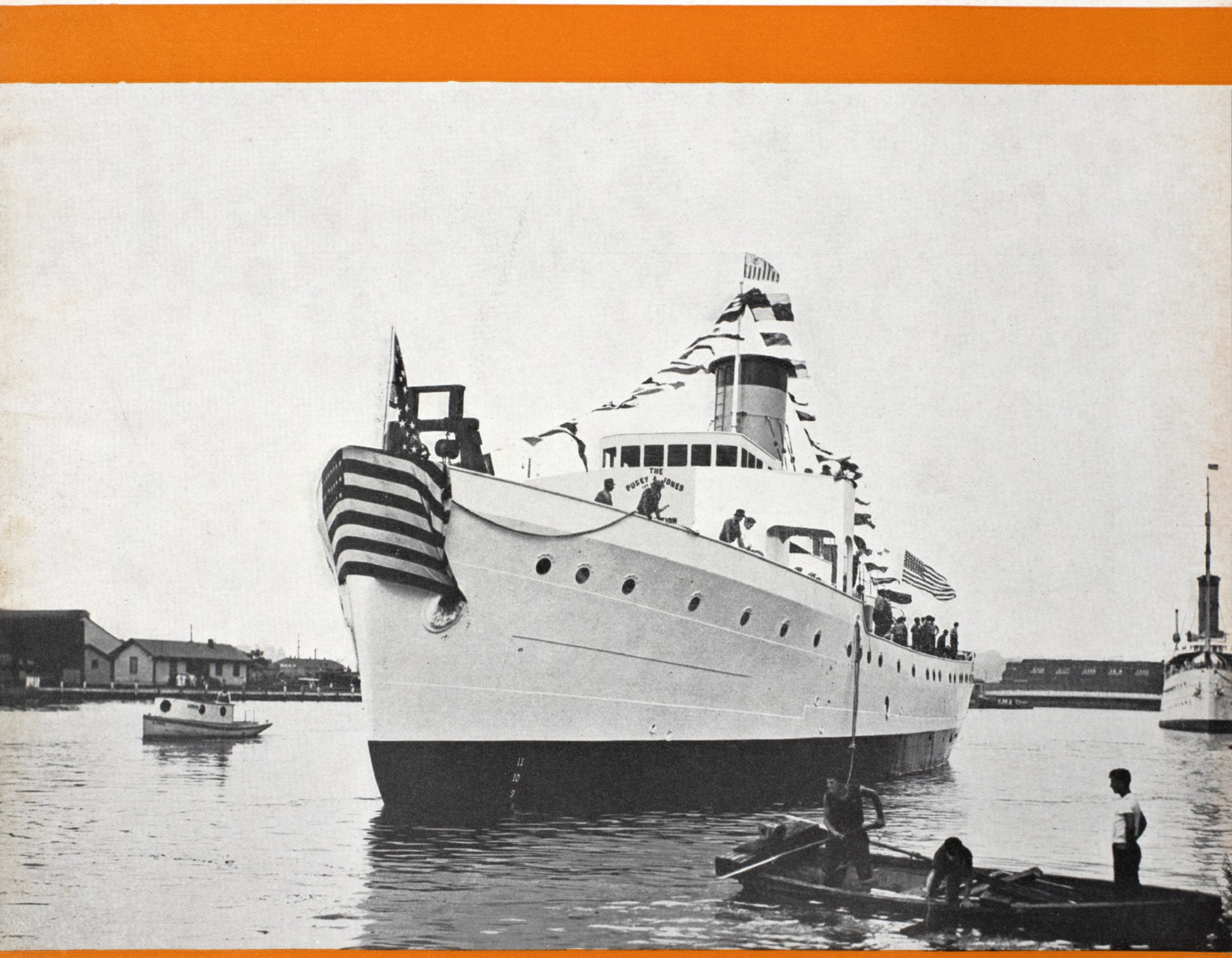
An interesting new bulletin on generating sets has been issued by the Troy Engine & Machine Co., Troy, Pa.

The new bulletin covers a complete range of sizes for both vertical and horizontal engine driven generators for direct and alternating current and for both marine and stationary service. The information is very complete and clear and there are numerous illustrations.

Marine Review

Reg. U. S. Pat. Off.

The National Publication Covering the Business of Transportation by Water



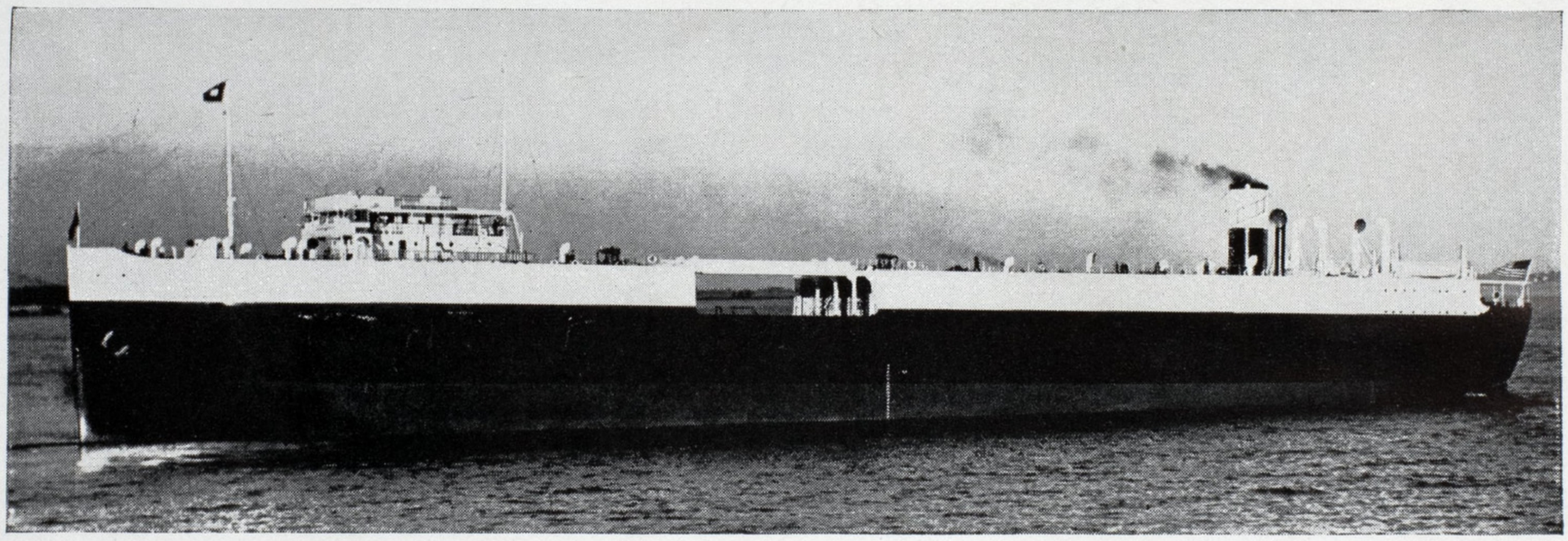
Algonquin—Coast Guard Cutter

September, 1934

SHIPS . . .

—To Meet Every Requirement
—The Latest Design and Construction

The Sun Shipbuilding & Drydock Co. is in a unique position to handle construction of practically every type of ship and can point proudly to a long list of successful vessels now in operation of which the Seatrains New York and Havana are unique examples.



S. S. Seatrain New York S. S. Seatrain Havana

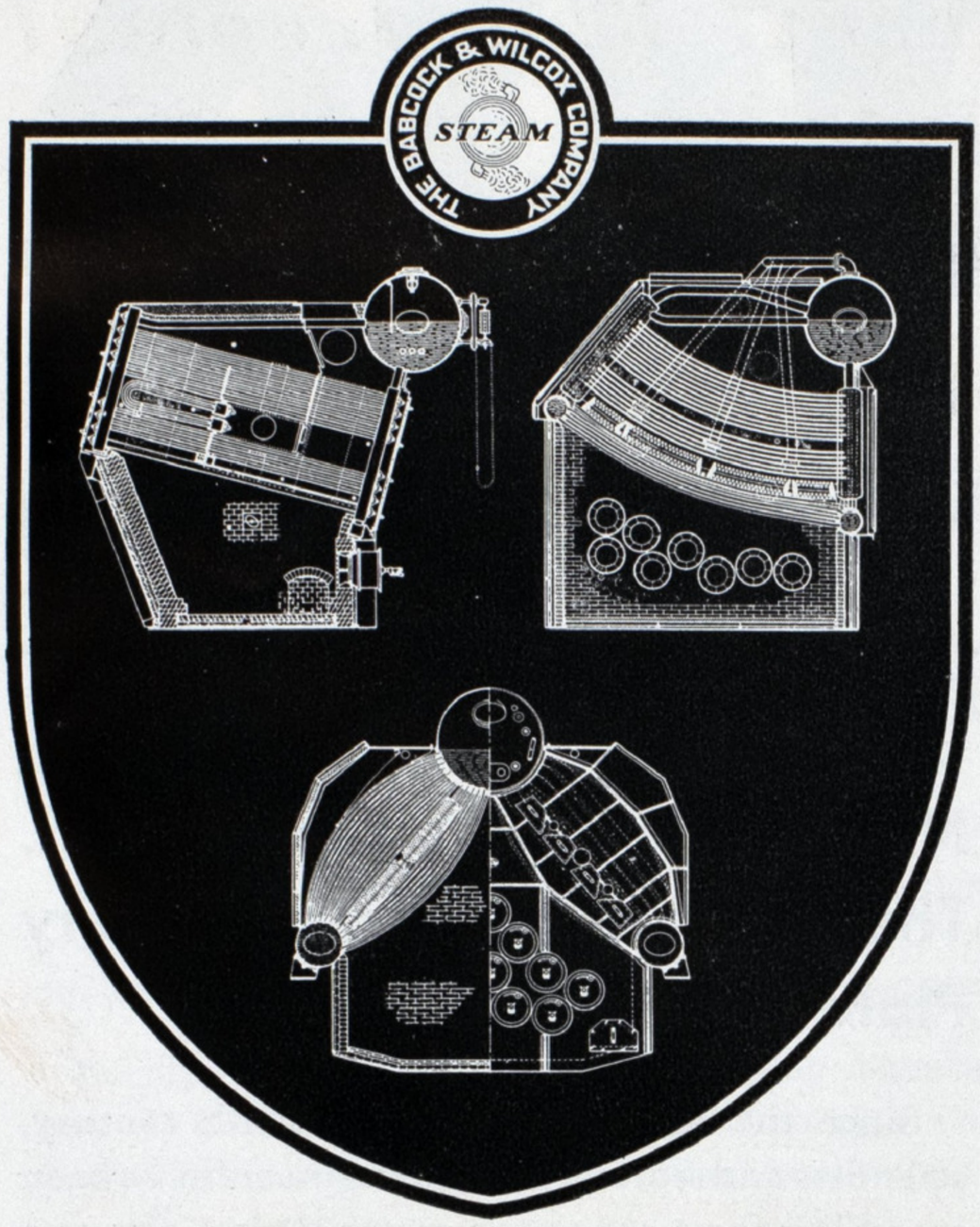
Fast Seagoing Freighters (17 knots) for Carrying Loaded Freight Cars on Four Decks.

All Types of
MARINE REPAIRS

SUN SHIPBUILDING & DRYDOCK CO.
CHESTER, PA.
New York Office: 25 Broadway

Vol. 64, No. 9, September, 1934, issue of MARINE REVIEW, published monthly at Cleveland, O. Entered as second class matter at the post office, Cleveland, O., under act of March 3, 1879. Subscription price $3 a year in U. S.; Canada, $4; Great Britain and other foreign countries, £1. Single copies, 35c

Innovations in design... advantageous or merely "different"?



Although The Babcock & Wilcox Company has effected extensive changes in existing steam-generating equipment and has developed many new and outstanding designs, no change or no new design has ever been introduced merely to offer something new, something different.

Instead, each advance has been based on experience and brought into existence to meet effectively a definite need . . . a need disclosed only through constant and intelligent study of the requirements of the Marine Industry.

The Babcock & Wilcox Company, 85 Liberty St., N. Y.

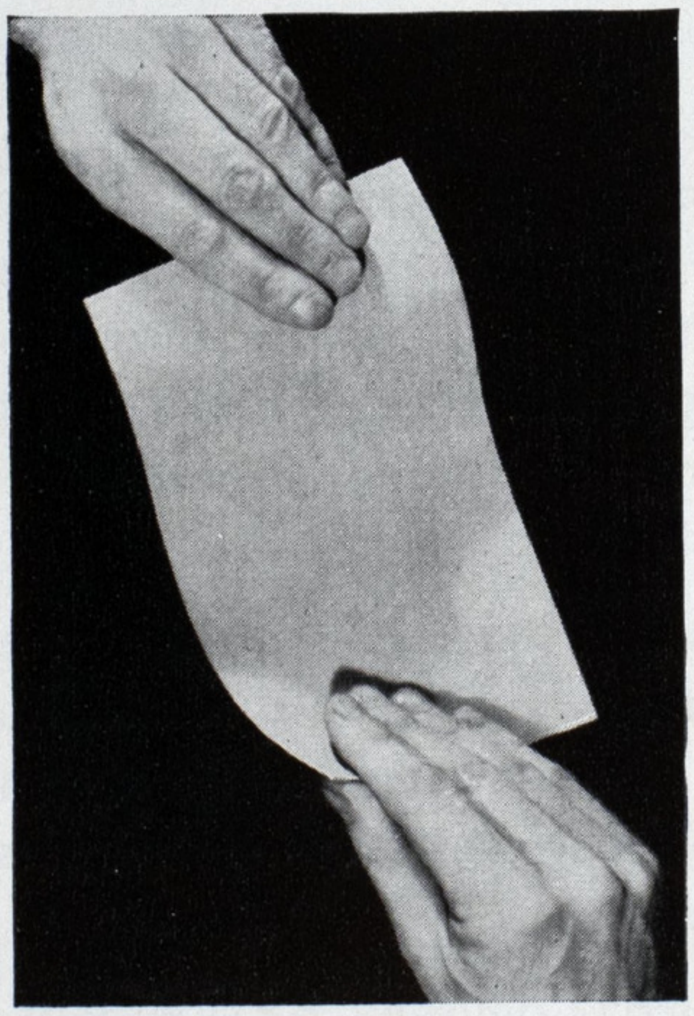
BABCOCK & WILCOX

M-38

Exide

ANNOUNCES AN OUTSTANDING IMPROVEMENT

New Exide Mipor Separator . . The Permanent Storage Battery Plate Insulator



Inherent structural strength, resiliency and porosity are among the many desirable characteristics of the New Exide Mipor Separator. It is not affected by high temperatures or severe vibration under adverse operating conditions.

Since the middle of the nineteenth century, scientists and storage battery engineers have been searching for a separator material that acts as a permanent electrical insulator, while permitting a free and uninterrupted diffusion of electrolyte. A material of uniform structure and strength, with the necessary mechanical qualities to withstand severe vibration and rough conditions of service to which a battery is often subjected. A material unaffected by either electrolyte or excessive battery temperatures. Exhaustive tests, in the laboratory and the field, have proved that this long-sought-for material has been found in Exide Mipor.

Exide-Ironclad Batteries for marine and electric industrial truck service are now equipped with this revolutionary new separator—Exide Mipor. It is a development of the most overwhelming significance in storage batteries—the most important since 1910, when the Exide-Ironclad Battery was introduced.

"Mipor" (Reg. U. S. Patent Office) is derived from the word "Microporous," descriptive of its almost infinitesimal pores.

NRA CODE

Features of Exide Mipor Separators

Insulate plates from each other permanently.
Prevent passage of particles of active material between plates.
Immune to battery heat.
Perfectly uniform in all dimensions.
Longer life.
Outstanding economy.
Reduced maintenance.
Freedom from trouble and service interruptions.
A permanent separator that will last the life of the battery.

IN STORAGE BATTERIES . . . . . .

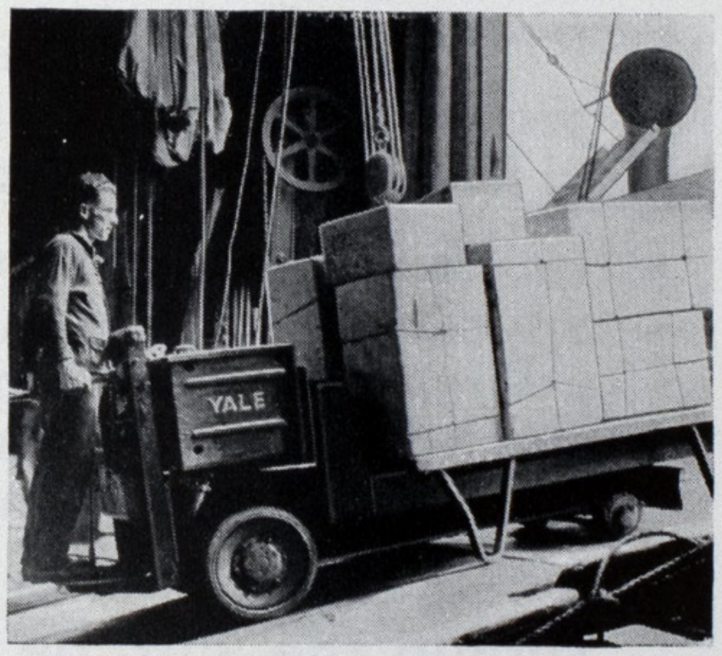
WHAT IT IS

Exide Mipor consists of vulcanized rubber, permeated by microscopic pores so numerous as to permit free diffusion of the electrolyte, yet so minute as to be a barrier to the smallest particles of active material.

Because it is vulcanized with heat during manufacture, Exide Mipor is immune to the heat encountered in the battery. It does not crack, crumble or break down under severe operating conditions.

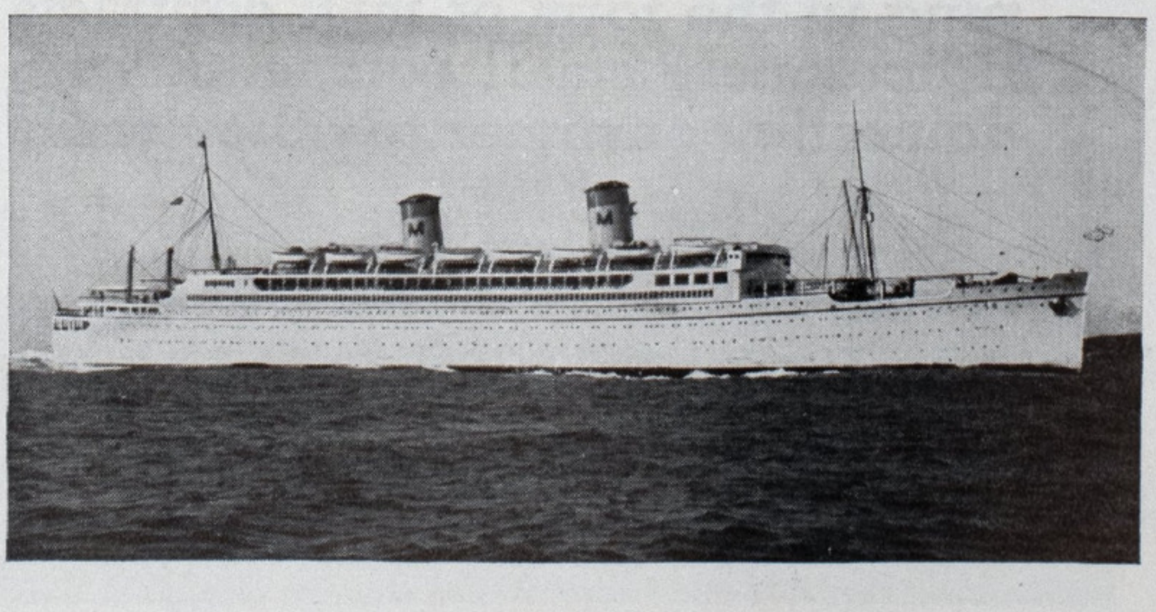
WHAT THIS MEANS TO EXIDE-IRONCLAD USERS

The advantages that Exide Mipor offers to users of these batteries are unique. Longer life, reduced maintenance, greater economy—these are available in fuller measure than ever before to Exide-Ironclad users. The development of Exide Mipor and its use in Exide-Ironclad Batteries means a good battery made still better. The use of the Exide Mipor separator increases tremendously the value of Exide-Ironclad Batteries in service—for they include this great improvement at no increase in price. This means still lower battery operating costs. Write for copy of new booklet giving full details on Exide Mipor, the permanent storage battery plate insulator.



Electric Industrial Trucks

Marine Service



THE ELECTRIC STORAGE BATTERY CO., Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

Exide
IRONCLAD
BATTERIES

WITH EXIDE MIPOR SEPARATORS

Entitled to Protection

THE general policy of the United States is that of giving legitimate aid and encouragement to her industries. A survey for the year 1930 shows that the sugar tariff cost the American people $300,000,000 for that single year. Tobacco growers were protected to the extent of $440,000,000 while cotton manufacturers derived benefits totaling $240,000,000. The silk goods people benefited in the amount of $225,000,000, leather goods were boomed more than $100,000,000 and chemicals brought in the tidy sum of $120,000,000 above the unprotected price. It remained for the steel industry to eclipse all others as premier beneficiary of the nation's tariff policy. American consumers in 1930 paid this industry more than $1,000,000,000 above the free trade price.

Yet it is a remarkable thing that many Americans, who favor protection for our basic land industries, are adverse or indifferent to the extension of similar aid to our ships in foreign trade.

American tariffs increase the cost of ship construction and operation through a general elevation of the price structure. Our overseas shipping has no home market. It is forced to produce according to the American standard of living and it must sell in competition with ships built and operated by low-wage countries.

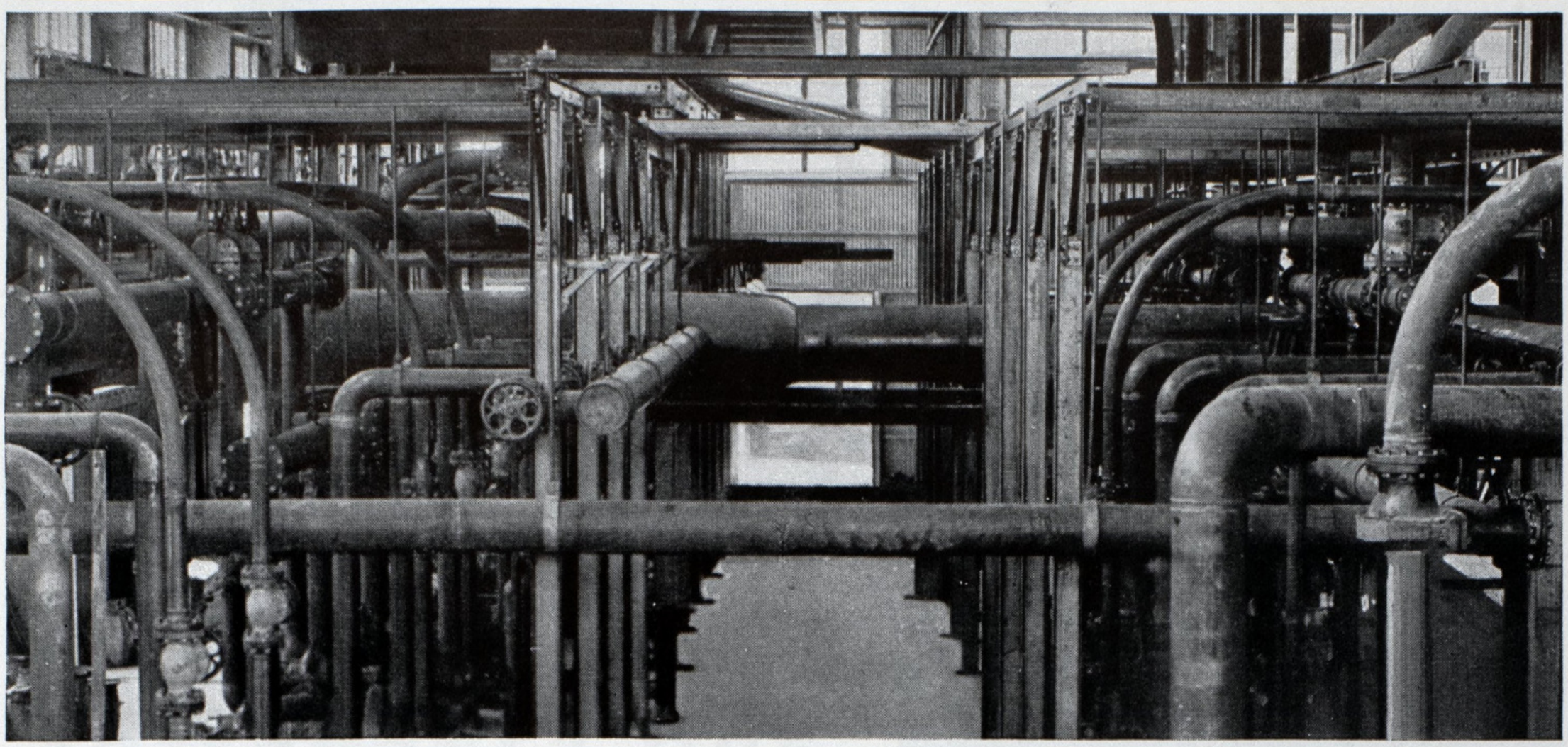
If protection is the acknowledged course of this nation why should the ship be left to perform its economic services overseas without protection?

Surely the $20,000,000 a year now paid to American shipping in the form of mail contracts is not without precedent and is ridiculously small compared with the huge amounts paid by the domestic consumer to other basic industries.

NEW YORK SHIPBUILDING CORPORATION

Main Office and Yard:
CAMDEN, N. J.

New York Office:
420 LEXINGTON AVENUE



LINDE PROCESS SERVICE *goes with* LINDE OXYGEN

● *In this power house piping system almost 3,000 oxwelded joints have been made. The installation includes high and low pressure steam pipe from ½ in. to 36 in. in diameter —all with permanently leakproof oxwelded joints.*

LINDE Service Operators are the "firing line" for Linde Process Service, which is available to users of Linde Oxygen to help them apply the oxy-acetylene process of welding and cutting most effectively.

On the installation of miles of piping of many sizes partially illustrated here, Linde Service Operators cooperated from start to finish. They aided the customer's own engineers in selecting the materials and equipment, testing and qualifying operators of welding equipment, giving instruction in the latest developments of pipe welding and organizing the welding routine for greatest speed, dependability and economy.

Lindewelding was used on all the outside piping—over 20 miles of it. And inside, almost 3,000 welds were made. These were in high and low pressure steam lines, of sizes ranging from ½ in. to 36 in. in diameter. There were vertical lines and lines overhead and underground with many turns and special fittings.

The pipe was welded into a compact network — streamlined outside and inside. There are no projections or rough surfaces inside to obstruct the flow. Outside the jointless smoothness makes the lines easier to insulate and saves space. All lines are free from leaks under high pressure test, and will remain leakproof permanently.

Through its experience with the problems of thousands of Linde customers, Linde Process Service is qualified to translate the best practices of the day into your actual needs wherever oxy-acetylene welding and cutting is involved. The nearest Linde Sales Office will gladly give you further information.

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

126 Producing Plants UCC 859 Warehouse Stocks

IN CANADA, DOMINION OXYGEN CO., LTD. TORONTO

LINDE OXYGEN • PREST-O-LITE ACETYLENE • OXWELD APPARATUS AND SUPPLIES • UNION CARBIDE

PRODUCT OF A UNIT OF UCC UNION CARBIDE AND CARBON CORPORATION

You are cordially invited to visit the numerous exhibits sponsored by the Corporation in both the Basic and Applied Sciences in the Hall of Science at Chicago's 1934 A Century of Progress Exposition. Here you will see how users of products and processes developed by Units of Union Carbide and Carbon Corporation benefit from a most unique coordination of scientific research with manufacturing, sales and service facilities.

Sales Offices:

Atlanta	Houston	Portland, Ore.
Baltimore	Indianapolis	St. Louis
Birmingham	Kansas City	Salt Lake City
Boston	Los Angeles	San Francisco
Buffalo	Memphis	Seattle
Butte	Milwaukee	Spokane
Chicago	Minneapolis	Tulsa
Cleveland	New Orleans	
Dallas	New York	
Denver	Philadelphia	
Detroit	Phoenix	
El Paso	Pittsburgh	

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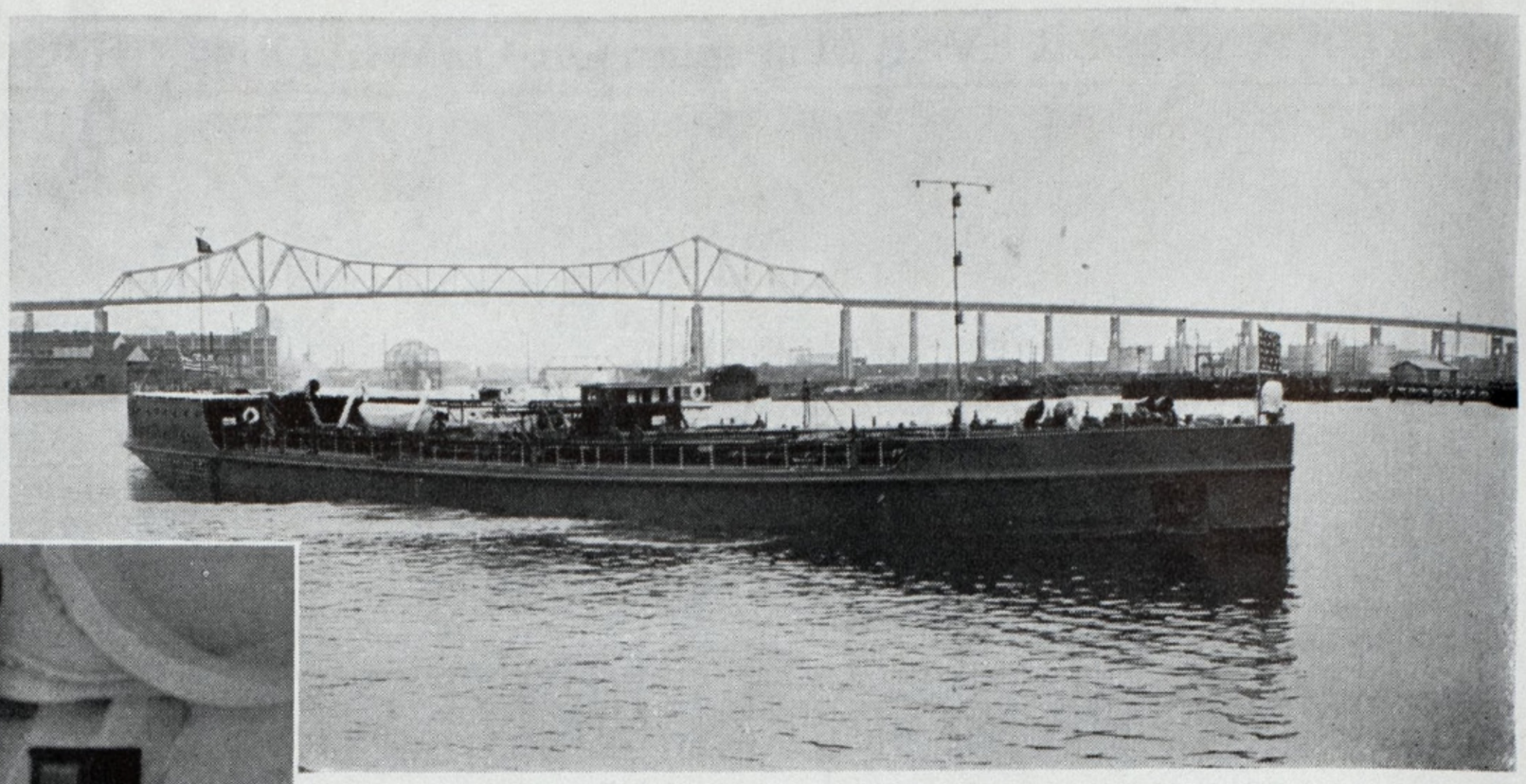
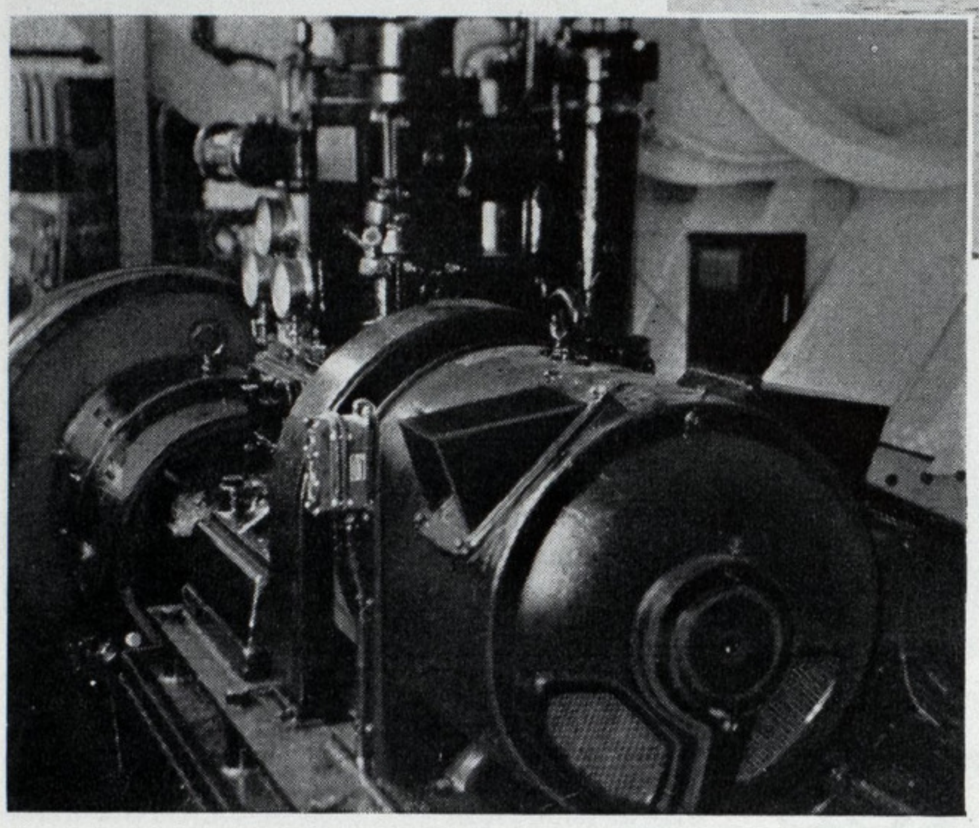


Diehl 30 Horsepower Marine Motor coupled to Worthington Air Compressor, also Diehl 60 K.W. Diesel Generator connected McIntosh & Seymour Engine.



Every Motor and Generator built by Diehl

Auxiliaries
equipped with
DIEHL MOTORS

include
WORTHINGTON
Air Compressors

NORTHERN PUMP CO.
Pumps

AMERICAN ENGINEERING
Steering Gear, Capstan and Windlass

McINTOSH and SEYMOUR
Diesel Engines

Also
DIEHL FANS
and
BLOWERS

FROM the main generators to the smallest pump motor, every motor and generator aboard the new "Socony" tanker New Haven was built by Diehl. That "Socony" is already using many Diehl motors and generators, and has again selected them for this latest ship is evidence of their reliability and economy.

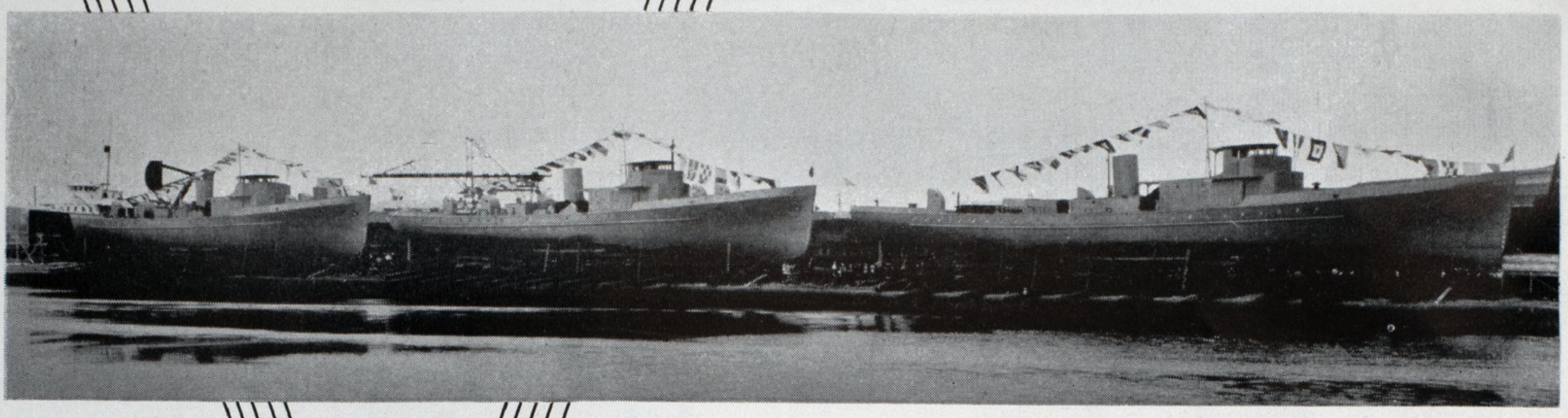
The Diehl motor shown coupled to a Worthington air compressor in the engine room is characteristic of the careful design and skillful workmanship embodied in all Diehl apparatus for shipboard use. Drip-proof frame construction . . . special marine insulation . . . non-corrodible fittings . . . exceptionally compact bearing arrangement . . . and other features that insure unfailing service and provide important operating advantages.

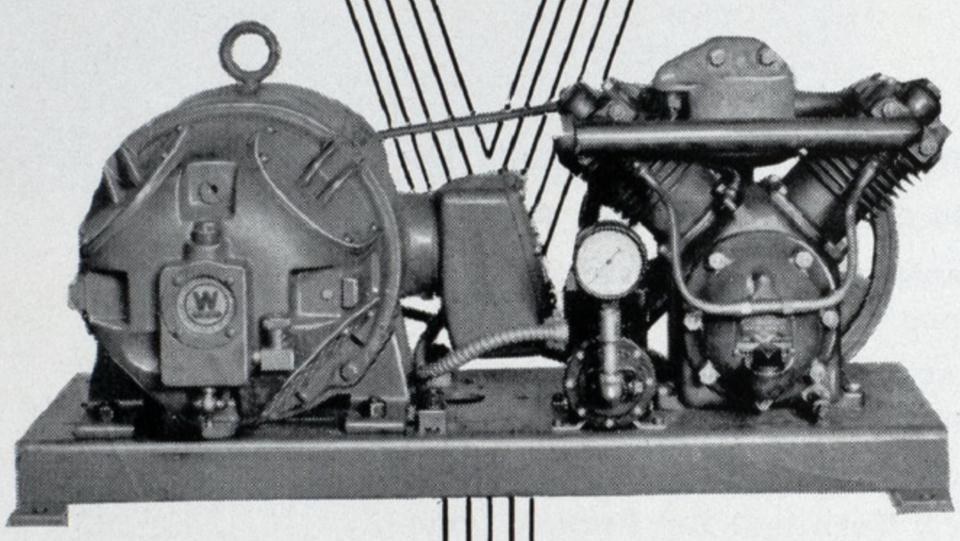
When you have an electrical problem, utilize Diehl's many years experience building marine type motors, generators and fans; and extensive resources for development of special electrical equipment. Our engineers will gladly study your requirements and submit constructive suggestions without obligation.

DIEHL MANUFACTURING COMPANY

Electrical Division of
THE SINGER MANUFACTURING COMPANY
Elizabethport, N. J.

DIEHL





These PATROL BOATS
and six others, have
the new **TYPE "Y"**
WESTINGHOUSE
AIR COMPRESSOR

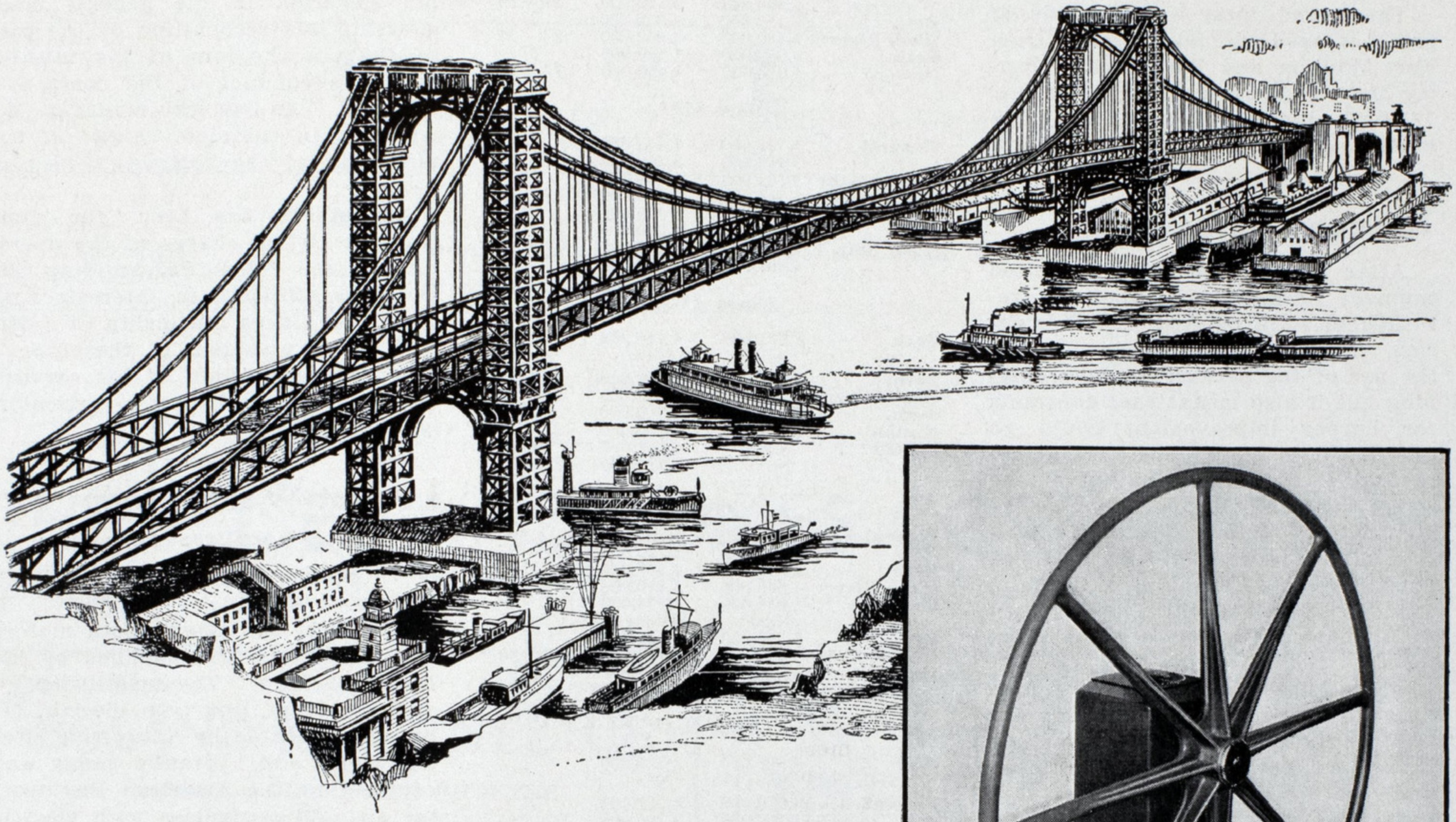
The Type "Y" Compressor is suitable for use where an efficient, reliable, and economical air supply of moderate volume is needed (sizes ranging from 4 to 31 cu. ft.) . . It has: An efficient means of air cooling . . . A controlled lubricating system, reliable and positive. . . . Ball bearing support of motor and compressor shafts . . . A positive unloading feature interlocked with lubricating system that protects the compressor by preventing operation against load if oil supply is dangerously low. . . Rugged construction throughout, assuring long trouble-free service.

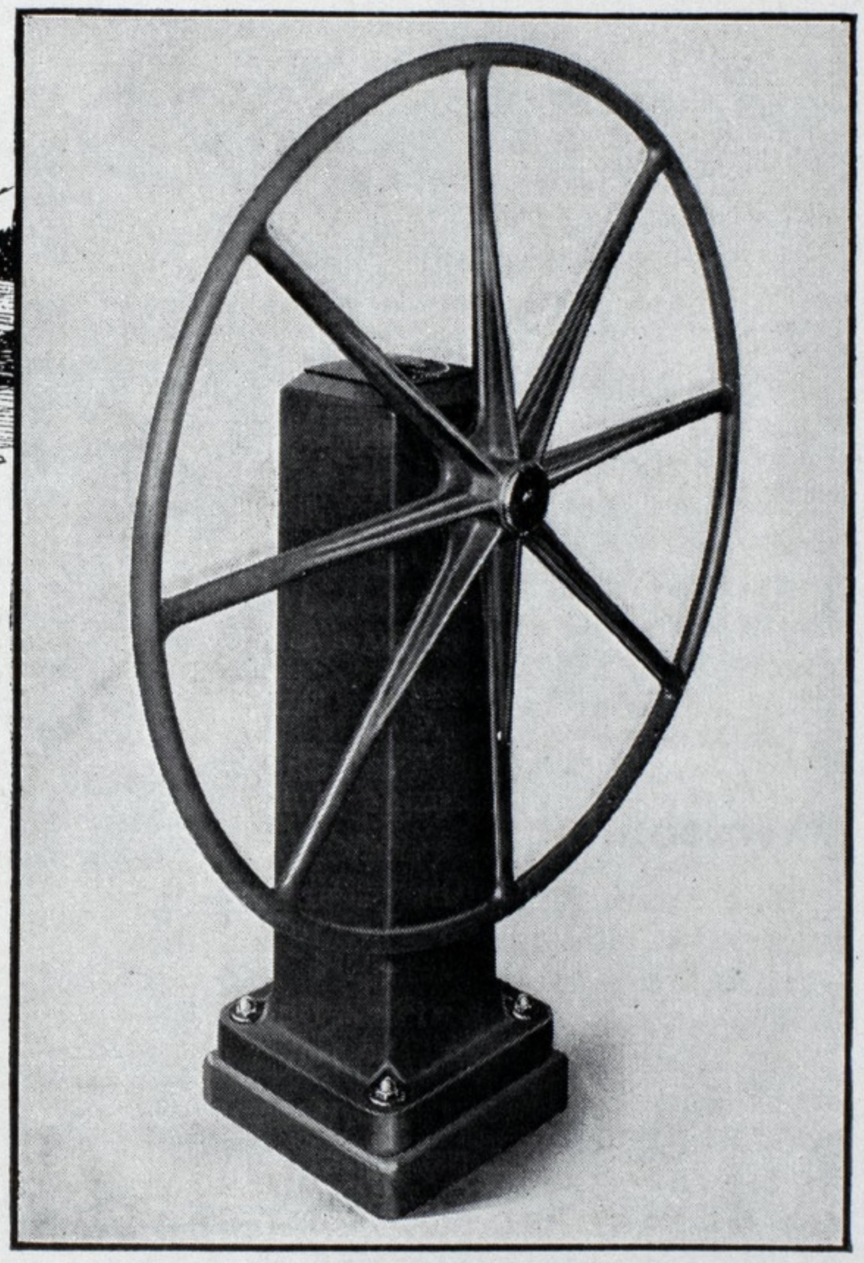
The coast guard patrol boats, Dione, Electra, and Pandora, recently launched by the Manitowac Shipbuilding Corp., as well as the three being built by the Lake Union Dry Dock & Machine Works, and the three under construction at the Marietta Mfg. Co.'s shipyards, are equipped with the new WESTINGHOUSE Type "Y" Compressor, 11 cu. ft. displacement, that supplies air for alarm whistle. . . This is but one of our several types, ranging in sizes up to 300 cu. ft. displacement, motor-driven and steam-driven, suitable for all classes of marine service.

WESTINGHOUSE AIR BRAKE CO.
GENERAL OFFICE *and* WORKS
WILMERDING, PA.

The SPERRY *Electro-Mechanical* STEERING SYSTEM

BRIDGES THE GAP





THERE are many vessels of intermediate size which are large enough to require power steering and which are not too large to be steered manually in an emergency. It is for these vessels that the Sperry Electro-Mechanical Steering System has been designed and developed.

As its name implies, this gear combines in one system a complete power steering equipment and a complete manual steering equipment. It is operated electrically. If, however, the power supply should fail or be interrupted for any reason, the wheelsman simply continues to steer with the same wheel and in the same manner. There are no switches, couplings or levers to operate in making the change over. The only difference between electrical and manual operation is that the wheelsman must provide the power for moving the rudder. When the electrical supply is restored, he merely continues to steer. As far as his operation of the steering system is concerned, the change has never occurred.

A descriptive booklet will be sent on request.

SPERRY GYROSCOPE CO., *Inc.*

BROOKLYN — NEW YORK

—in 1930:	Dearie, the doctor says you need a rest.	All right, Sweetheart—but not just now. I'm too busy.
—in 1931:	Dearie, the doctor says you need a rest.	All right, Sweetheart—but not just now. I can't afford it.
—in 1932:	Dearie, the doctor says you need a rest.	All right, Sweetheart—but not just now. I haven't got the money.
—in 1933:	Dearie, the doctor says you need a rest.	All right, Sweetheart—but not just now. Wait 'til I get out of the red.
—in 1934:	Yes, I think a year of complete rest will set him on his feet again. He's just worn out, that's all.	

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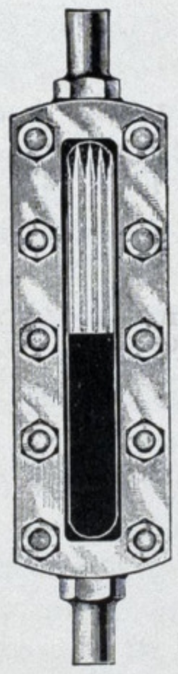

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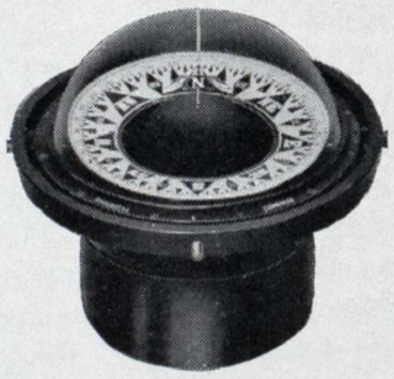

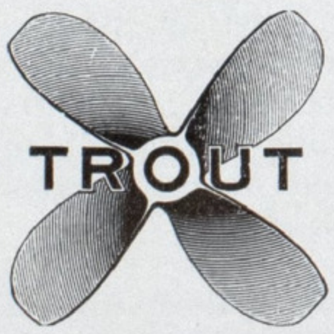

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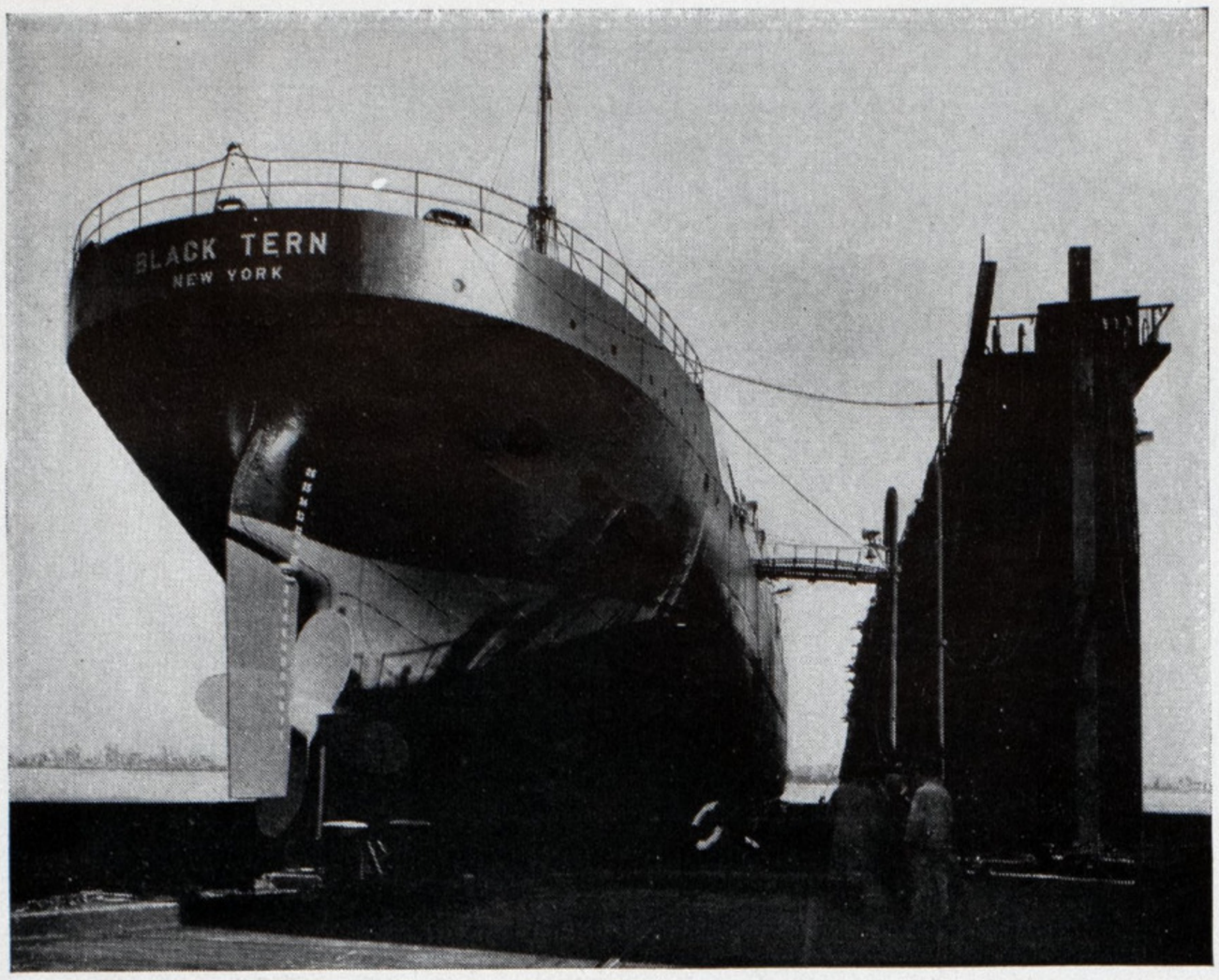

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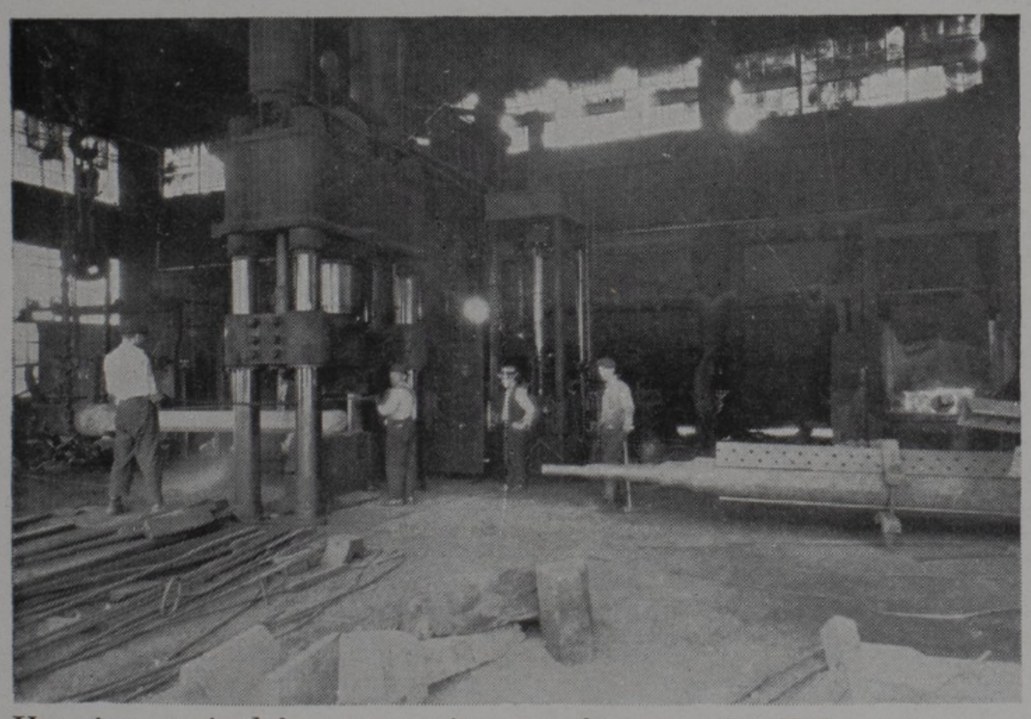

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